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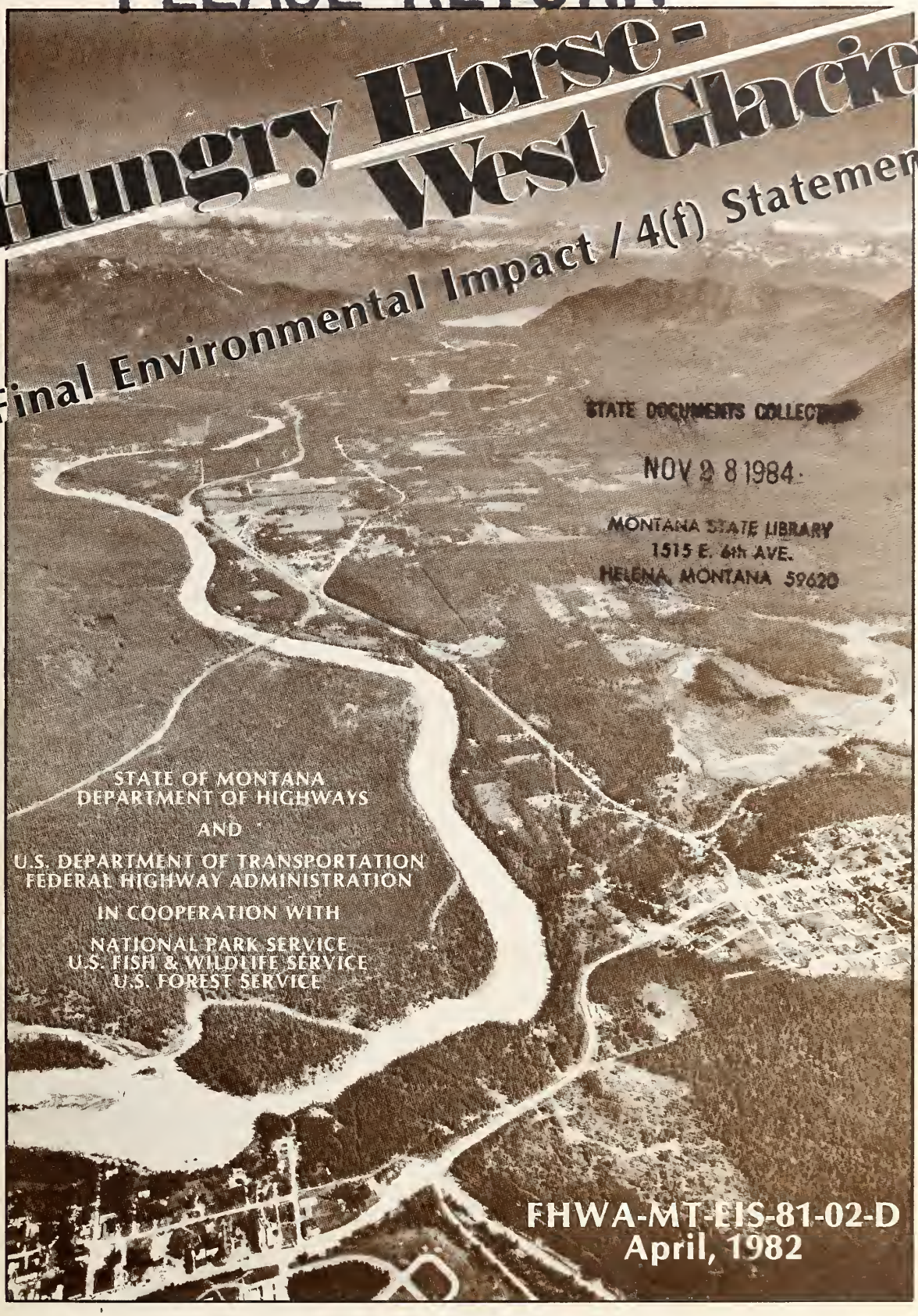

STATE OF MONTANA
DEPARTMENT OF HIGHWAYS
AND
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
IN COOPERATION WITH
NATIONAL PARK SERVICE
U.S. FISH & WILDLIFE SERVICE
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HUNGRY HORSE - WEST GLACIER

FINAL ENVIRONMENTAL IMPACT/4(f) STATEMENT

STATE OF MONTANA
DEPARTMENT OF HIGHWAYS

AND

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

IN COOPERATION WITH THE
NATIONAL PARK SERVICE
U.S. FISH & WILDLIFE SERVICE
U.S. FOREST SERVICE

Submitted pursuant to 42 U.S.C. 4332 (2) (C), 23 U.S.C. 128(a),
49 U.S.C. 1653(f), 16 U.S.C. 470(f),
Executive Order 11988 and Executive Order 11990

Gary J. Wicks

Gary Wicks, Director
Montana Department of Highways

4/6/82
Date

Original Signed by
Fred Hempel

Director, Office of Environmental Programs
Federal Highway Administration

AUG 27 1982
Date of Approval

ADDITIONAL INFORMATION

The following persons may be contacted for additional information concerning this document:

Mr. William Dunbar
Project Development Engineer
Federal Highway Administration
Drawer 10056
Helena, Montana 59626
406/449-5305

Mr. Stephen Kologi, Chief
Preconstruction Bureau
Montana Dept. of Highways
2701 Prospect Avenue
Helena, Montana 59620
406/449-2495

ABSTRACT OF E.I.S.

This Environmental Impact Statement addresses the environmental impacts related to the reconstruction of a 11.37-mile section of U.S. Highway #2 on the west side of Glacier National Park from the town of Hungry Horse to West Glacier. The project consists of improving the alignment and reconstructing the existing highway (that was originally built in 1931) to a standard that would satisfactorily handle existing and projected traffic. The major considerations of this EIS include high summertime traffic volumes, access to Glacier National Park and adjacent wilderness areas, and impacts on the human and natural environments. The basic issue is whether a two-lane or a four-lane highway is the proper facility to construct. A two-lane highway would result in slightly less adverse natural environmental impact, but would result in some traffic congestion during the summer months. The four-lane facility requires more resources to construct, but would provide for a higher level of traffic service. Design variations of two-lane and four-lane highway alternatives are evaluated in this EIS.

The preferred alternative consists of a 64-foot-wide highway in rural areas (four 12-foot travel lanes, two 6-foot shoulders, and a 4-foot median) and a 66-foot-wide highway in the communities of Hungry Horse, Coram, and West Glacier (four 12-foot travel lanes and two 9-foot parking lanes).

This alternative was selected because it provides a higher level of traffic service for a small increase in cost and only slightly more impact on the natural environment than the two-lane alternatives. The preferred alternative will be adequate for a number of years in the future, which is an important consideration when it is recognized that the existing highway has been in service for almost 50 years.

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SUMMARY

SUMMARY

A. PROJECT DESCRIPTION

This Environmental Impact Statement contains an evaluation of the proposed improvement of U.S. Highway #2 in the northwestern part of Montana beginning at the east end of the bridge over the South Fork of the Flathead River near the western edge of the town of Hungry Horse, Montana and ending at the town of West Glacier, Montana. The length of the proposed improvement of this highway is 10.93 miles.

The proposed project would replace a narrow highway (approximately 22-foot-wide pavement surface) that was originally built in 1931. This highway has been repaired at various times since it was constructed, but is considered inadequate to safely handle current and projected traffic volumes. This route is part of the major east-west route in the northern part of Montana, and also provides access to Glacier National Park.

The initiation of a project along this route was motivated by several factors:

* The age and condition of the highway make it impractical to continue using the existing facility without major construction improvements.
* Traffic accident records indicate that loss of life and property are excessive.
* The area residents have expressed a need for a new highway.
* Current and projected traffic volumes and composition cannot be handled efficiently and safely by the existing facility.

B. ALTERNATIVES CONSIDERED

In 1974, the Montana Department of Highways prepared an Environmental Impact Statement for the construction of a four-lane, 88-foot-wide roadway with no access control.[1] The construction of this project was ultimately halted in 1979 when courts determined that the EIS prepared in 1974 did not adequately cover several issues.[2] The alignment originally proposed for this highway was to generally follow the existing roadway with minor realignments to be made in four areas to eliminate sharp curves and improve geometric characteristics. During the period from 1976 to 1979, design plans and specifications were prepared and utility relocation and tree removal contracts were awarded and completed on approximately one-half of the project corridor.

During the Scoping and Establishing Alternatives meetings held for this EIS, virtually all participants considered the original alignment satisfactory. In view of this, only alternatives that were within the right-of-way that was designated for the original alignment were developed and considered. Since eighty to ninety percent of the right-of-way along the original alignment has been purchased and the major impacts due to relocation have already occurred,[3] it is reasonable to limit the alternatives to the right-of-way limits established. To date, no opposition to this position has been expressed.

The alternatives that were developed and considered appropriate for this EIS are described below. All alternatives except the no-build alternative would be constructed within the right-of-way limits established for the original design and would include bicycle/walkway facilities. No control of access is planned for any of the alternatives.

Alternative No. 1: An 88-foot-wide four-lane highway consisting of two 12-foot travel lanes and a 10-foot shoulder in each direction in addition to a 20-foot median as originally proposed.

Alternative No. 2: A 60-foot-wide four-lane highway consisting of two 12-foot travel lanes and a 4-foot shoulder in each direction with a 4-foot paved median or turning lanes in the rural areas where determined necessary and a 14-foot-wide center turning section in the communities.

Alternative No. 3: A specially designed two-lane highway incorporating such improvements as climbing and turning lanes for 5.0 miles of the length, turnouts in rural areas, and a 16-foot-wide center turning section in the communities.

Alternative No. 4: A 44-foot-wide two-lane highway consisting of a 12-foot travel lane and a 10-foot shoulder in each direction.

Alternative No. 5: No-build alternative.

C. PREFERRED ALTERNATIVE

The evaluations contained in this EIS limit the logical choices to a narrow four lane or a special design two lane. Of these two alternatives, the preferred alternative is the narrow four lane. This alternative has only marginally more impact on the natural environment, provides a high level of traffic service for the foreseeable future, and is only slightly more costly than the special design two lane. The narrow four-lane alternative is therefore judged to be the best investment of limited highway construction funds, and the most appropriate facility for the area.

The preferred alternative is a slightly modified version of Alternative No. 2 (60-foot-wide four lane) utilizing six-foot shoulders instead of four-foot shoulders, and with parking provided in the communities in lieu of a median. The separate bikeway/walkway will extend from Hungry Horse to Coram, with the six-foot shoulder used as a bikeway from Coram to West Glacier. A detailed description of the preferred alternative is contained in Part II (C), "Proposed Action".

The preferred alternative will not take any parkland or affect any historic sites.

D. SIGNIFICANT ISSUES

The issues that were considered to be significant to this project were identified through an extensive scoping process incorporating scientific inquiry, public comment, and local, state and federal agency involvement.

A number of important issues were identified and addressed as part of the EIS process. These include concern about traffic and pedestrian safety, the ability to handle expected traffic, impacts in Glacier National Park and other environmentally sensitive areas, secondary impacts related to increased development, and other human and environmental impacts that are discussed in this report.

In addition to these and other significant issues, studies required by EIS guidelines and regulations were completed and included in this EIS.

E. PRIMARY IMPACTS

The proposed highway alternatives that involve construction would result in certain commitments of resources and probable environmental impacts. The no-build alternative also involves impacts, chiefly of a human nature, and provides a baseline for comparison with the remaining alternatives.

The primary impacts that would result from this project are summarized below. Many of the adverse consequences would be reduced or prevented through the implementation of the mitigating measures that are described in Part V.

* Impacts to wildlife and vegetation will occur, but would not be of a major nature. Although no specific data exists, it is the opinion of wildlife biologists that the most probable and significant impact would be that a wider highway would likely make it more difficult for grizzly bears to migrate from major habitat areas on both sides of the highway.
* Secondary development is expected to increase as a result of better transportation and access to the area with any of the build alternatives. Even if no improvement in access is provided, development along the corridor is expected to continue. This would adversely affect the wildlife in the area since habitat would be reduced and human interference would increase.
* Traffic safety would be substantially improved with a significant decrease in the number of accidents occurring along the corridor to be expected with any of the build alternatives.
* Pedestrian traffic would be improved since pedestrian facilities would be provided where there are currently none available.
* During construction, temporary disruption of the natural area along the corridor will occur, local residents would be subjected to noise, dust, and other inconveniences, and traffic delays would occur.
* The improved highway would be able to handle the traffic demands in a more comfortable and convenient manner.

F. ISSUES TO BE RESOLVED

The primary issue to be resolved is the type of highway facility to be constructed. The traffic studies completed for this EIS indicate that a four-lane highway would be required to adequately handle traffic through the design year. The four-lane highway would cause some minor additional development to occur due to the improved access. Traffic and pedestrian safety aspects of the most logical two-lane and four-lane alternatives are approximately equal. The evaluation of the impact on the natural environment indicates that the two-lane highway would cause less adverse impact than a four-lane highway, as would logically be expected.

A major point of controversy is whether traffic congestion should be tolerated for the two peak traffic months of the year (July and August) to reduce environmental impacts, or if a higher level of traffic service should be provided with minor added construction costs and impacts on the natural environment.

G. ACTIONS REQUIRED BY OTHER AGENCIES

In addition to the preparation of this EIS by the Montana Department of Highways and the Federal Highway Administration, other state and federal agencies will have involvement in the project. These agencies and their area of jurisdiction are as follows:

State

Montana Department of Health and Environmental Sciences - Section 3(a) authorization allowing temporary increase in water turbidity

Montana Department of Health and Environmental Sciences - wastewater discharge permit for storm drainage facilities

Montana Department of Fish, Wildlife & Parks - Stream Protection Act clearance

Montana Historic Preservation Office - Historic Preservation Act, Section 106 clearance (completed)

Federal

U.S. Army Corps of Engineers - Section 404 of the Clean Water Act

U.S. Fish & Wildlife Service - Endangered Species Act Biological Opinion (completed)

H. OTHER SIGNFICANT GOVERNMENT ACTIONS

There are no other significant actions proposed by other government agencies along the highway corridor of which we are aware.

REFERENCES FOR SUMMARY

1. Final Environmental/Section 4(f) Statement for Project F-257(16), Hungry Horse - West Glacier, Montana Department of Highways and Federal Highway Administration, February 20, 1974.

2. Court Order, United States Court of Appeals for the Ninth Circuit, D.C. #79-1, No. 79-4843.

3. Gordon Foley, Supervisor, Land Section, Right-of-Way Division, Montana Department of Highways, in a personal communication, June, 1981.

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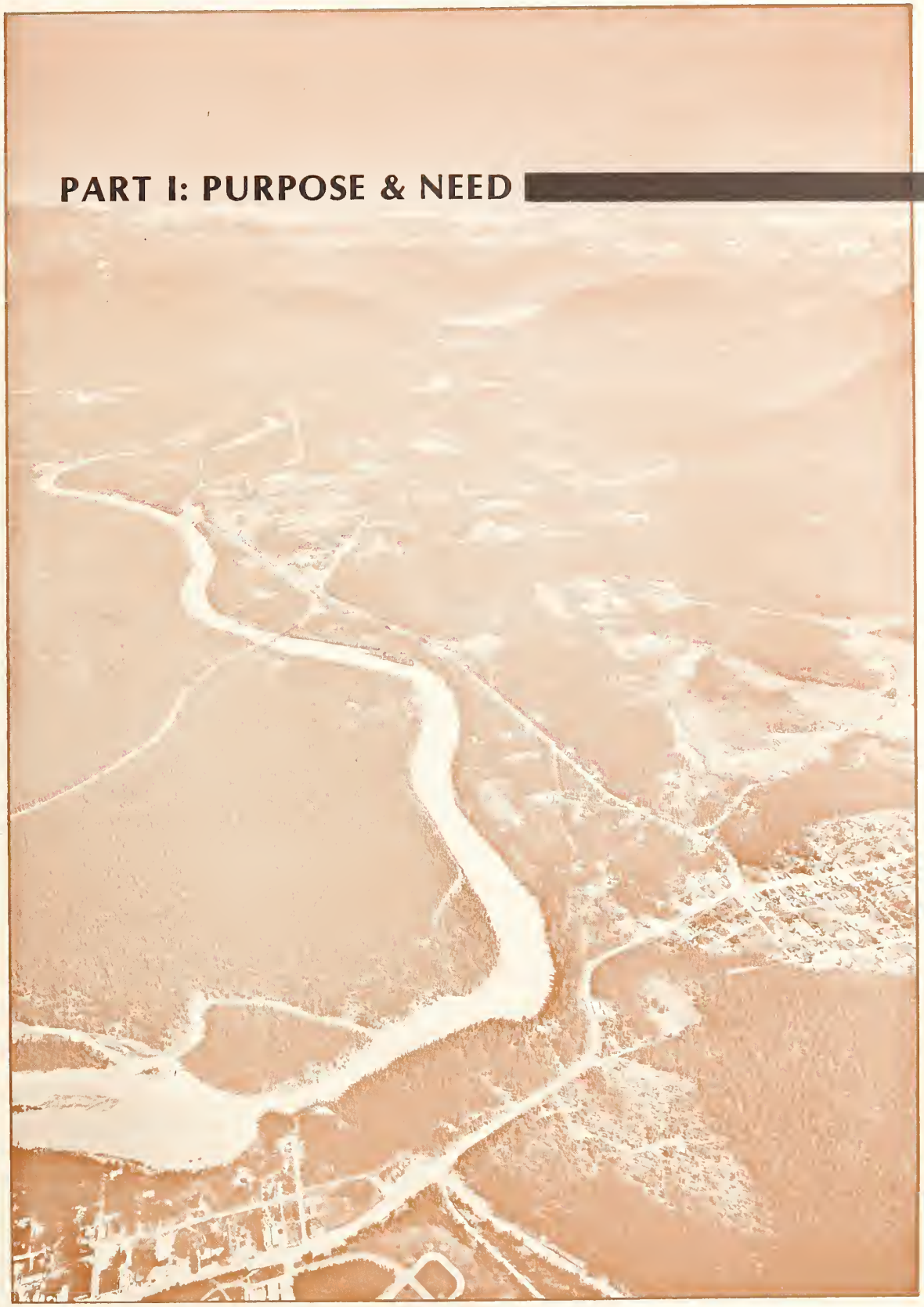
PART I: PURPOSE & NEED



PART I: PURPOSE AND NEED FOR THE ACTION

A. DESCRIPTION OF PROJECT

This project is located in the northwestern part of Montana between the communities of Hungry Horse and West Glacier. The nearest major city is Kalispell, which lies approximately 20 miles to the southwest. Figure 1 shows the general location of the project. The route passes through a relatively lightly populated forested area which serves as a transition into the scenic Glacier National Park and Great Bear Wilderness areas. This route is a part of U.S. Highway #2 which is the only year-round major east-west route between Montana 200 and the Canadian Border.

This route is on Federal Aid Primary Route 1. The federal aid primary system consists of an extensive system of connected main roads important to interstate, statewide, and regional travel and are continuous rural arterial routes and their extensions into or through urban areas. The federal aid primary system is designated by the State Department of Highways subject to approval by the U.S. Department of Transportation - Federal Highway Administration. This section of highway has been on the primary system since October 9, 1922.

Traffic volumes along the corridor vary from 3,780 vehicles per day near Hungry Horse to 2,735 vehicles per day near West Glacier, based on 1981 traffic counts taken in May and July and seasonally adjusted to an annual average daily count. The traffic gradually decreases in volume along the corridor from Hungry Horse to West Glacier except for a slight rise in traffic near the West Glacier turn which is attributed to local traffic. According to the analyses conducted for this project, traffic is expected to increase by 50 to 70 percent by the year 2003.

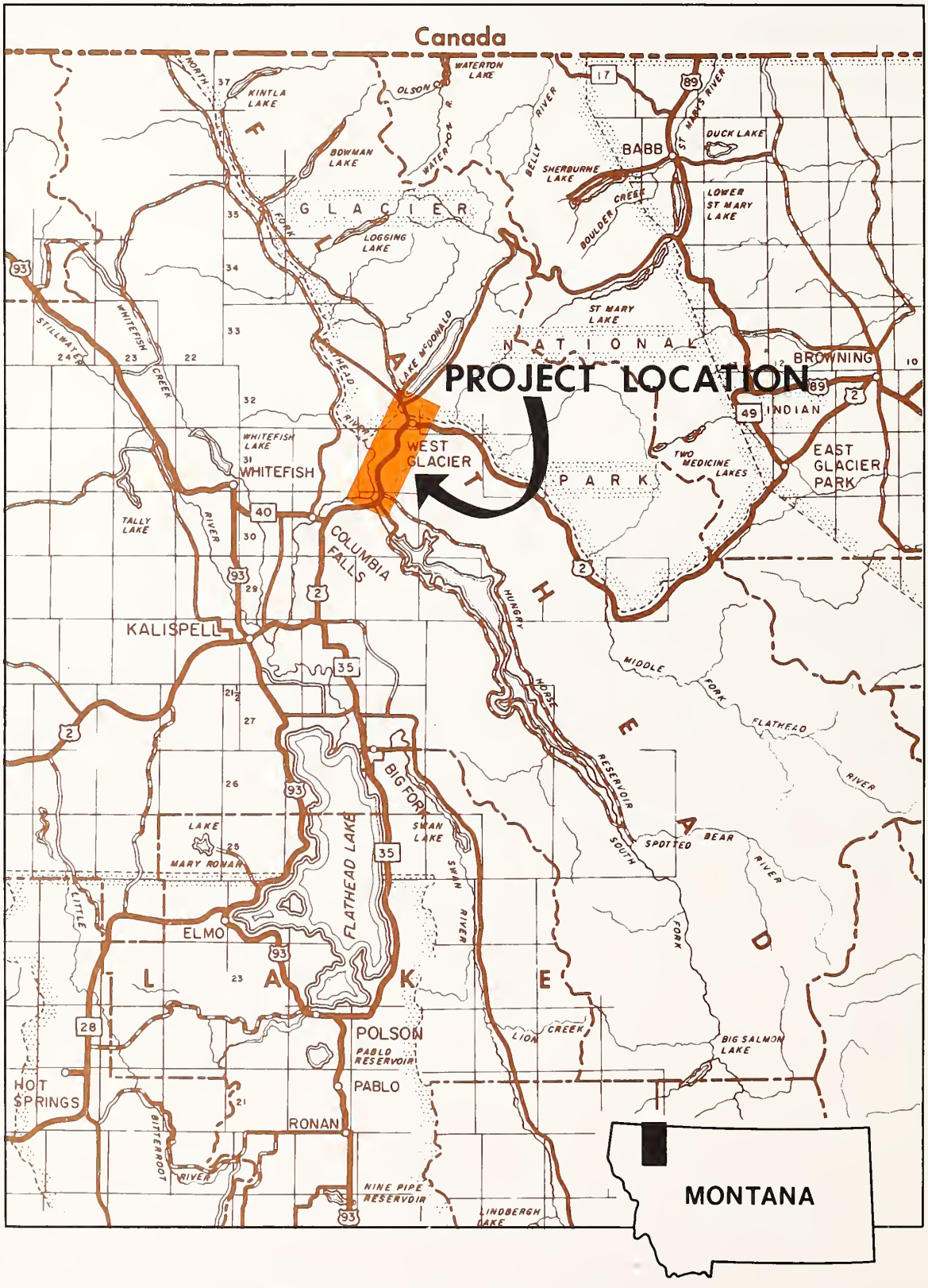


FIGURE 1–PROJECT AREA LOCATION MAP

B. HISTORY OF PROJECT

This project has been under consideration for improvement by the Montana Department of Highways since 1962, a period of almost twenty years. The Department of Highways had formal plans for a four-lane highway from Hungry Horse to just east of Martin City and a widened two-lane highway for the remaining distance to West Glacier by 1968. This concept was later changed to a four-lane facility for the entire length of highway, with final authorization for a continuous four-lane highway received from the Federal Highway Administration in April, 1975.

A final Environmental Impact/4(f) Statement dated February 20, 1974 was prepared for the project by the Montana Department of Highways and the Federal Highway Administration. Advance acquisition of right-of-way was approved by the Federal Highway Administration in March of 1975. Approval to acquire all of the right-of-way was received from the Federal Highway Administration on May 15, 1978. A timber sale contract to remove timber from Forest Service parcels on the right-of-way from Coram to West Glacier was let on October 20, 1978 and timber was removed by the middle of November. A clearing contract on the Coram - West Glacier section was let on June 28, 1979 and completed by April, 1980. During this period, utilities were also relocated on this section.

In the spring of 1976, opposition to the four-lane facility surfaced, with some area residents supporting an improved and widened two-lane roadway instead of a four-lane highway. A non-profit corporation called the Coalition for Canyon Preservation was formed in November, 1978 to oppose the four-lane facility. This organization filed suit on January 5, 1979 against the Secretary of Transportation, Administrator of the Federal Highway Administration, Director of the Montana Department of Highways, and members of the Montana Highway Commission to prevent further actions on the project on the basis that the EIS prepared for the project was inadequate.

The District Court denied relief and dismissed the action on November 14, 1979. An appeal to the Ninth Circuit Court of Appeals was applied for by the Coalition on December 18, 1979. The Court of Appeals granted injunctive relief and expedited the appeal. On October 9, 1980, the Court of Appeals reversed the judgment of the District Court. Pursuant to the mandate of the Court of Appeals, the District Court enjoined construction of any improved highway in the Hungry Horse - West Glacier corridor on November 7, 1980.

Following the decision by the Court of Appeals, the Montana Department of Highways initiated the process of redoing the EIS.

C. PURPOSE AND NEED

The primary objectives of this project are as follows:

* Upgrade an outmoded link in the Federal Aid Primary Highway system in the State of Montana

* Reduce accidents by improving the physical characteristics of this section of highway
* Improve the traffic carrying capability of the highway for local and through traffic to be consistent with current and future traffic demands
* Improve the efficiency of the transportation system so that people and goods can have the benefit of better, safer, and more economical transportation.
* Provide a scenic highway corridor to Glacier National Park

Transportation in Montana is vital to the state's economy. Montana's basic economic sectors rely heavily on an efficient highway system to transport primary products such as agricultural commodities, lumber and minerals to market. The tourism industry, which has long been important to Flathead County as well as the rest of Montana, is also reliant upon the highway network to safely transport visitors and sightseers to and from area attractions.[1] In light of declining rail service, the state's dependence on highway transportation will continue to increase,[2] requiring replacement of facilities that are inadequate and unsafe. The section of highway under consideration for this project is on an important route which fulfills these needs as well as providing major access to Glacier National Park and servicing local traffic needs.

The need for this project has been illustrated by the Montana Department of Highways Sufficiency Rating. This rating is an index which provides a measure of how well a particular section of highway is fulfilling its purpose. The rating given for this section of highway and the ratings for a fully satisfactory section of highway are shown in Table No. 1.

TABLE NO. 1

HIGHWAY SUFFICIENCY RATING

RATING FACTOR	COMPLETELY ADEQUATE HIGHWAY	PROJECT RATING
Foundation	10	0
Surface	30	11
Drainage	10	5
Safety	20	1
Capacity	30	17
Total	100	34*

* Rating adjusted to 28 due to higher-than-average traffic volumes in accordance with established Dept. of Highways procedures.

The adjusted rating of 28 for this rural primary highway places it in the category of critically deficient and probably in need of immediate construction, according to the 1980 Montana Primary Highways Sufficiency Rating.[3]

During the summer months, this highway operates at or near the traffic capacity of the highway. Accident rates are very high, particularly for the section from Hungry Horse to Coram. The physical characteristics of the highway including the roadway foundation, width, curvature, and sight distance are very poor, which is evidenced by high maintenance costs.

The improvements proposed for this highway are intended to relieve the traffic congestion, and to improve the safety and driving comfort characteristics as well as providing a scenic entrance to Glacier National Park.

D. MEETINGS ON ALTERNATIVES

During the preparation of the EIS, several meetings were held to obtain public comment and suggestions. One of these meetings was specifically oriented to establishing the highway improvement alternatives that would be considered appropriate for this corridor. At the conclusion of these meetings, the consensus was that the alternatives that were selected for analysis were the appropriate options. At the same time it was established that the alignment of the highway as originally designed was acceptable, and that it was not necessary to investigate additional alignments. The current highway alignment as well as the proposed alignment for this project are shown on Figure 2.

E. IDENTIFICATION OF SIGNIFICANT AND NON-SIGNIFICANT ISSUES

Public scoping meetings, public workshop sessions, and a cooperating agency scoping meeting held on April 20 and 21, 1981 and written comments were used to identify the significant issues that should be addressed in the EIS, as well as those issues which were not felt to be significant.

It became apparent during the meetings that two major factions exist: 1) a faction favoring a four-lane highway due to the traffic safety and economic benefits that they felt were offered by a four-lane highway; and 2) a faction which felt that a two-lane highway was more appropriate for the area since they felt it would be adequate for traffic and less environmentally damaging. A third, less vocal faction felt that a new highway was needed regardless of type, and that either a two- or four-lane highway would be satisfactory.

A review of the comments received strengthens this assessment. During the scoping meetings it was difficult to restrict the meetings to receiving comments on the significant issues, and most comments were addressed to a preference of either a two- or a four-lane highway. Nonetheless, several valuable comments were made that gave insight into those issues that were considered important by one faction or the other.

In assessing and identifying those issues that are considered significant or non-significant, it should be noted that there was considerable discrepancy between the two factions. What one faction considered important was very likely to be considered unimportant by the other faction. If an issue was considered important by either faction (or by a cooperating agency) and was pertinent and reasonable, it was considered to be a significant issue. The stronger the conviction and the more often a subject was discussed, the more significant the issue was considered to be.

Table No. 2 shows the significant and non-significant issues that were identified.

TABLE NO. 2

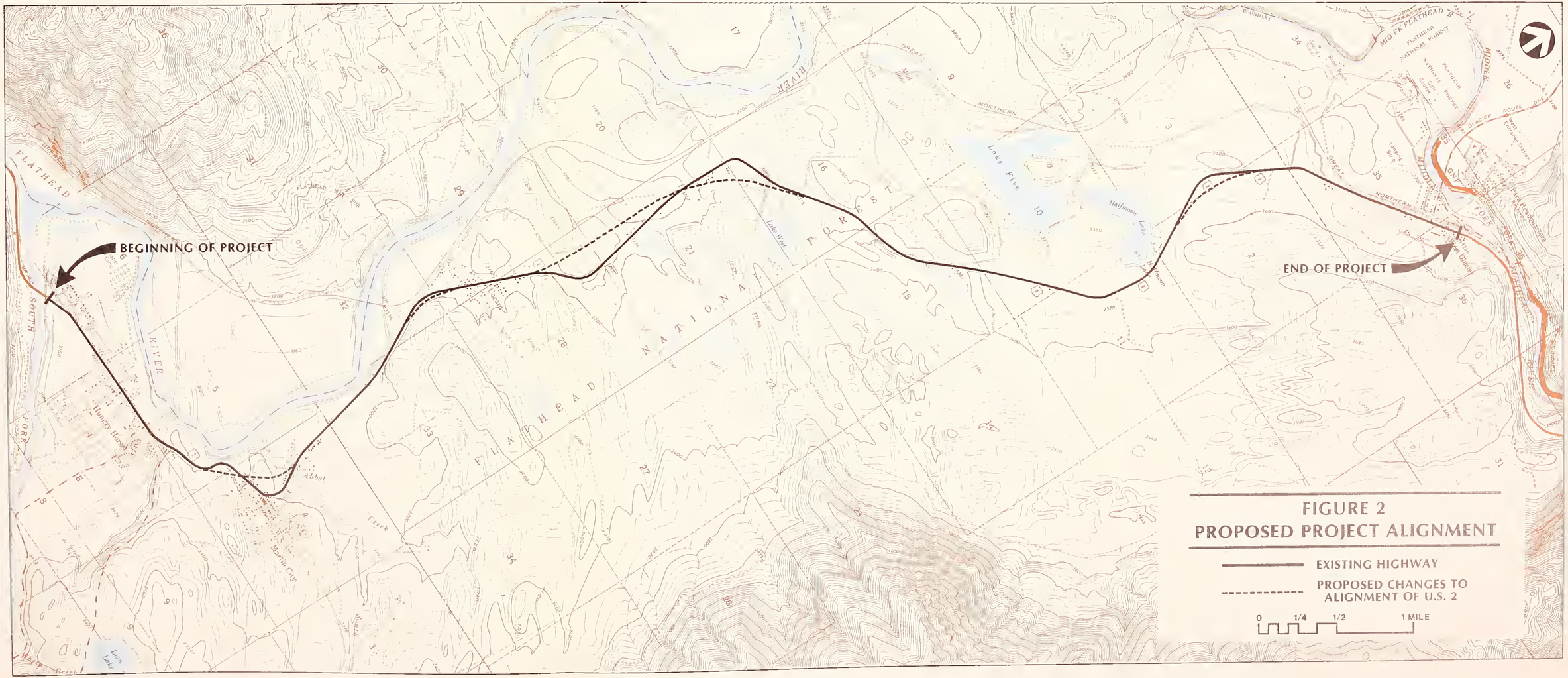
IDENTIFICATION OF SIGNIFICANT & NON-SIGNIFICANT ISSUES

SIGNIFICANT ISSUES

1. Traffic & Pedestrian Safety Aspects of Highway
2. Ability to Handle Automobile & Truck Traffic
3. Loss of Habitat & Barrier Effect to Wildlife
4. Threats to Glacier National Park
5. Maintenance Costs of Highway Alternatives
6. Provisions for Pedestrians & Bicyclists
7. Construction Costs of Highway Alternatives
8. Social & Economic Impact of Highway
9. Secondary Impacts Related to Increased Development
10. Provisions for Tourist & Access Traffic
11. School Crossing & Public Safety
12. Possible Degradation of Natural Environment in Corridor
13. Storm Drainage & Potential Stream Pollution
14. Cost/Benefit Analysis
15. Energy Efficiency and Consumption
16. Regional as Opposed to Local Perspective
17. Use of Current Information & Trends for Evaluation
18. Use of Highway to School & Emergency Vehicles
19. Flood Plains & Wetlands
20. Preservation of 4(f) Lands
21. Other (Mass Transit, Noise, Air Pollution, etc.)

NON-SIGNIFICANT ISSUES

1. Need to Examine Additional Alignments


BEGINNING OF PROJECT
END OF PROJECT
FLATHEAD
SOUTH FORK
RIVER
FLATHEAD NATIONAL FOREST
NORTHERN
GREAT
Lake Five
Halfmoon Lake
Lake West
Abbot
Creek
Martin City
Hungry Horse
Lion Lake
MID FK FLATHEAD R.
MIDDLE FORK
GLACIER
Glacier Park Headquarters
Belton
Park
Entrance
Station
Lodge
Camp
Dam
Trail
Ranger Station
Boundary
FIGURE 2
PROPOSED PROJECT ALIGNMENT
EXISTING HIGHWAY
PROPOSED CHANGES TO ALIGNMENT OF U.S. 2
0 1/4 1/2 1 MILE

In addition to these issues, studies required by EIS guidelines and regulations as well as those issues that were determined by the U.S. Court of Appeals to be deficient were completed and are included in this EIS.

REFERENCES FOR PART I

1. Economic Conditions in Montana; Report to the Governor 1980, Governor's Office of Commerce and Small Business Development, December, 1980, pp. 51 - 65.

2. A Prospectus for Change in the Freight Industry, & Preliminary Report by the Secretary of Transportation, U.S. Dept. of Transportation, Washington, D.C., October, 1978.

3. 1980 Montana Primary Highways Sufficiency Ratings, Montana Department of Highways, Planning & Research Bureau, December 31, 1980, pp. 5 and 18.

PART II: ALTERNATIVES

PART II: ALTERNATIVES, INCLUDING THE PROPOSED ACTION

A. SCOPING PROCESS

The process used to identify the significant issues that should be addressed and the degree to which they should be addressed in the development of an EIS is known as scoping. The scoping process used for this EIS includes: 1) publishing a Notice of Intent to prepare an EIS in the February 26, 1981 issue of the Federal Register; 2) inviting the participation of the following agencies that might have an interest in the project: Department of Interior - U.S. Fish & Wildlife Service, Department of Interior - National Park Service, Department of Agriculture - U.S. Forest Service, U.S. Army Corps of Engineers, and Environmental Protection Agency; 3) holding public scoping meetings and workshops near the project area; 4) holding a cooperating agency meeting near the project area; and 5) providing public information and receiving comments throughout the EIS process. The results of this scoping process provided guidance on the significant issues to be addressed and the alternatives which should be considered.

Scoping meetings were held in Columbia Falls, Kalispell, and Coram. Large photographs of the study corridor showing the original alignment of the proposed highway were prepared to provide orientation to the people attending the meetings. To aid in recording the people who attended these meetings and to allow attendees to conveniently offer comments, sign-in forms and comment forms were prepared.

The scoping meetings that were held are shown in Table No. 3.

TABLE NO. 3

SCOPING MEETINGS

MEETING TYPE	TIME	DATE	LOCATION
Workshop Session	1:00 - 5:00 p.m.	Apr. 20	Columbia Falls
Public Meeting	7:30 p.m.	Apr. 20	Columbia Falls
Cooperating Agency	9:00 a.m.	Apr. 21	Kalispell
Workshop Session	1:00 - 5:00 p.m.	Apr. 21	Coram
Public Meeting	7:30 p.m.	Apr. 21	Coram

These meetings were advertised on three radio stations (KOFI and KGEZ of Kalispell, and KJJR of Whitefish) and in three newspapers (the Hungry Horse News in Columbia Falls, and the Daily Inter Lake and the Kalispell Weekly News in Kalispell). The public meeting notices were also sent to individuals who had requested that they be placed on the Montana Department of Highways mailing list for the project.

These public meetings were tape-recorded. The workshop sessions and cooperating agency meeting were not taped. A summary of all of the meetings was prepared. These records are on file with the Montana Department of Highways in Helena.

B. ALTERNATIVES SELECTED FOR EVALUATION

This section describes the alternatives selected for evaluation. The range of alternatives was narrowed to those utilizing the original right-of-way when it was revealed during the scoping process that only these alternatives should be considered. There has been virtually no opposition to this position.

This decision is appropriate since much of the impact of right-of-way acquisition and relocation, and some of the impact of clearing the right-of-way has already occurred on the original alignment.[1] Changing the alignment would only add to these impacts. This is particularly true when it is recognized that nearly everyone feels that the original alignment is very good.

It was also determined during the scoping process that provisions should be made to accommodate pedestrians and bicyclists. This view was held by an overwhelming majority and concurred by local, state and federal agencies. Based on this, it was determined that for all roadway alternatives considered, with the exception of the no-build alternative, provisions would be made to accommodate bicycle and pedestrian traffic.

The following paragraphs describe the characteristics of the alternatives that were considered. For the purpose of comparison, each alternative (except the no-build alternative) follows the alignment of the original proposed highway. Grades for the two-lane alternatives were adjusted to meet the minimum design criteria for two-lane highways. Typical layouts for the five roadway alternatives are illustrated in Figure 3. No control of access is contemplated for any of the alternatives. Virtually all right-of-way has been acquired, and it is not con-

1 ALTERNATIVE 1 - 88′ FOUR-LANE

An 88-foot-wide four-lane highway consisting of two 12-foot travel lanes and a 10-foot shoulder in each direction with a 20-foot paved median.

2 ALTERNATIVE 2 - 60′ FOUR-LANE

A 60′ four-lane highway consisting of two 12-foot travel lanes and a 4-foot shoulder in each direction with a 4-foot paved median or turning lanes in the rural areas, where determined necessary, and a 14-foot-wide center section turning lane in the urban areas.

3 ALTERNATIVE 3 - SPECIAL DESIGN TWO-LANE

A special design two-lane highway incorporating such improvements as climbing and turning lanes in rural areas and a 16-foot wide center section turning lane in the urban areas.

4 ALTERNATIVE 4 - 44′ TWO-LANE

A 44-foot-wide two-lane highway consisting of a 12-foot travel lane and a 10-foot shoulder in each direction.

5 ALTERNATIVE 5 - NO-BUILD

No new construction would be provided. The existing condition using two 10-foot lanes with twin 1-foot shoulders would remain.

6 PREFERRED ALTERNATIVE — 64′ FOUR-LANE

A four-lane highway that would be 64 feet wide in rural areas and consist of four 12-foot travel lanes, a 4-foot median, and two 6-foot shoulders. In urban areas the highway would be 66 feet wide and consist of four 12-foot travel lanes and two 9-foot parking lanes.

A separate bikeway/walkway connecting Hungry Horse, Martin City and Coram will be provided to facilitate pedestrian and bicyclist traffic between these communities. A shoulder bikepath will be provided for bicyclists traveling from Coram to West Glacier.

FIGURE 3—TYPICAL ROADWAY LAYOUT FOR ALTERNATIVES

sidered practical to renegotiate the right-of-way to include access rights.

Sidewalks would be constructed for all of the alternatives except the no-build in the communities of Hungry Horse, Coram, and West Glacier where curbs were provided.

For all of the alternatives except the no-build, a separate bicycle path could be constructed. However, recent evidence has indicated that long-distance bikers are reluctant to use separate bicycle paths because they are seldom maintained to the same degree as the highway.[2] Another option would be to utilize the shoulder as the bike path, which would be easier to maintain. If this option was chosen, the paved shoulder could be used for the bike path for those alternatives which have continuous ten-foot shoulders (88-foot four lane and 44-foot two lane). For the 60-foot four-lane alternative, the four-foot shoulders could be used as a minimum facility or the shoulders could be widened for the bike path. For the special design two lane, the four-foot shoulder at turning and climbing lanes could either be used as a minimum facility or the shoulders could be widened. For all of these options, a factor to consider is the relatively low number of bikers and pedestrians that was observed along the corridor.

1. ALTERNATIVE NO. 1: FOUR-LANE, 88-FOOT-WIDE HIGHWAY

This alternative was selected as the recommended alternative in the original EIS dated February 20, 1974. The alternative consists of a four-lane highway with four 12-foot driving lanes, two 10-foot shoulders or parking lanes, and a 20-foot painted median for the length of the project. Curb and gutter with storm drainage facilities would be provided through the towns of Hungry Horse, Coram and West Glacier.

2. ALTERNATIVE NO. 2: FOUR-LANE, 60-FOOT-WIDE HIGHWAY

This alternative would be a narrower version of the four-lane highway approaching the minimum dimension standards for such a highway. The alternative consists of a four-lane highway with four 12-foot driving lanes, two 4-foot shoulders, and a 4-foot painted median in the rural areas. Through the communities of Hungry Horse, Coram and West Glacier as well as in areas of high turning movements, an additional 14-foot-wide turning lane would be added as appropriate. Curb and gutter with storm drainage facilities would also be provided through the towns of Hungry Horse, Coram and West Glacier.

3. ALTERNATIVE NO. 3: TWO-LANE, SPECIAL DESIGN HIGHWAY

This alternative would be a widened and improved two-lane highway incorporating design features such as climbing lanes, turning lanes, and pullouts to accommodate the special characteristics of the traffic and terrain in the area. This highway would include two 12-foot driving lanes and two 10-foot shoulders throughout much of its length

with approximately 1.9 miles of truck climbing lanes, 2.1 miles of left-turn lane, and 1.0 mile of both truck climbing and left-turn lanes. These additional lanes compensate for the 70 percent of the highway which would have limited passing sight distance. A 16-foot-wide turning lane in Hungry Horse, Coram and West Glacier and use of pullout areas for the convenience of heavy tourist travel in the rural areas would also be included in this alternative. Curb and gutter with storm drainage facilities would be provided through the towns of Hungry Horse, Coram and West Glacier.

4. ALTERNATIVE NO. 4: TWO-LANE, 44-FOOT-WIDE HIGHWAY

This alternative is a widened and improved two-lane highway normally built when higher traffic volumes do not require four travel lanes. The alternative consists of a two-lane highway with two 12-foot driving lanes and two 10-foot shoulders. Approximately 30 percent of the highway would have adequate passing sight distance. Curb and gutter with storm drainage facilities would be provided through the towns of Hungry Horse, Coram and West Glacier.

5. ALTERNATIVE NO. 5: NO-BUILD ALTERNATIVE

This alternative would not require any change to the existing 22-foot-wide two-lane highway that was constructed in 1931. The right-of-way that was purchased for the new alignment would be held in reserve for a future improvement or sold.

C. PROPOSED ACTION

The evaluations that were done as part of the Environmental Impact Statement limit the logical choices to a narrow four lane or a special design two lane. The wide four lane (88-foot highway) would create an excessive impact to the natural environment, and the standard two lane (44-foot highway) would not adequately handle the projected traffic volumes. For these reasons, the wide four-lane and standard two-lane alternatives are not considered appropriate for this project.

The selection of a preferred alternative between the narrow four lane and the special design two lane is difficult, since the appropriate facility depends on the criteria used for selection. The narrow four lane has slightly more impact on the natural environment but provides an adequate level of service for the foreseeable future, whereas the special design two lane is more desirable from the natural environment standpoint but would experience traffic congestion during the peak traffic periods in the summer.

Using criteria that are generally accepted by highway designers and after carefully considering the potential environmental impacts, the narrow four lane has been selected as the preferred alternative. This alternative has been selected because it provides a high level of traffic service, it will be adequate for many years in the future, it is not

much more costly than the special design two lane, and has only marginally more impact on the natural environment. The narrow four lane is judged to be the best investment of limited highway construction funds, and the most appropriate facility for the project.

During the review process for the Draft EIS, several pertinent comments were made that resulted in a modification of the 60-foot four-lane alternative for the preferred alternative. In the Draft EIS the 60-foot four lane was selected as the preferred alternative with options given for bikeway/walkway facilities (including a separate bikeway/walkway from Hungry Horse to West Glacier).

Due to the low bicycle and pedestrian counts and the preference of long-distance bikers to ride on paved shoulders,[2] it was determined that the most appropriate facilities for pedestrians and bicyclists would be: a separate bikeway/walkway connecting Hungry Horse, Martin City and Coram to facilitate pedestrian and bicyclist traffic between these communities, a shoulder bikepath from Coram to West Glacier, and back-of-curb sidewalks for pedestrians in the communities.

Since the separate bikeway/walkway would not be provided for the Coram-to-West Glacier section, it was decided that six-foot shoulders would be provided for use as a bikeway. Six-foot shoulders are also slightly more preferable than four-foot shoulders for safety reasons. Therefore, the preferred alternative would consist of a highway section that would be 64 feet wide in rural areas (four 12-foot travel lanes, a 4-foot median, and two 6-foot shoulders) and 66 feet wide in urban areas (four 12-foot travel lanes and two 9-foot parking lanes).

This alternative has been recommended because it provides a higher level of traffic service for slightly more cost and marginally more adverse impact on the environment than the two-lane alternatives. Since a two-lane facility would likely become deficient in 20 years or less and the four-lane facility would be adequate for the foreseeable future, it is considered a wise investment of limited highway construction funds to build the narrow four-lane highway for this project. This is particularly true when it is recognized that the existing highway has been in service for almost 50 years.

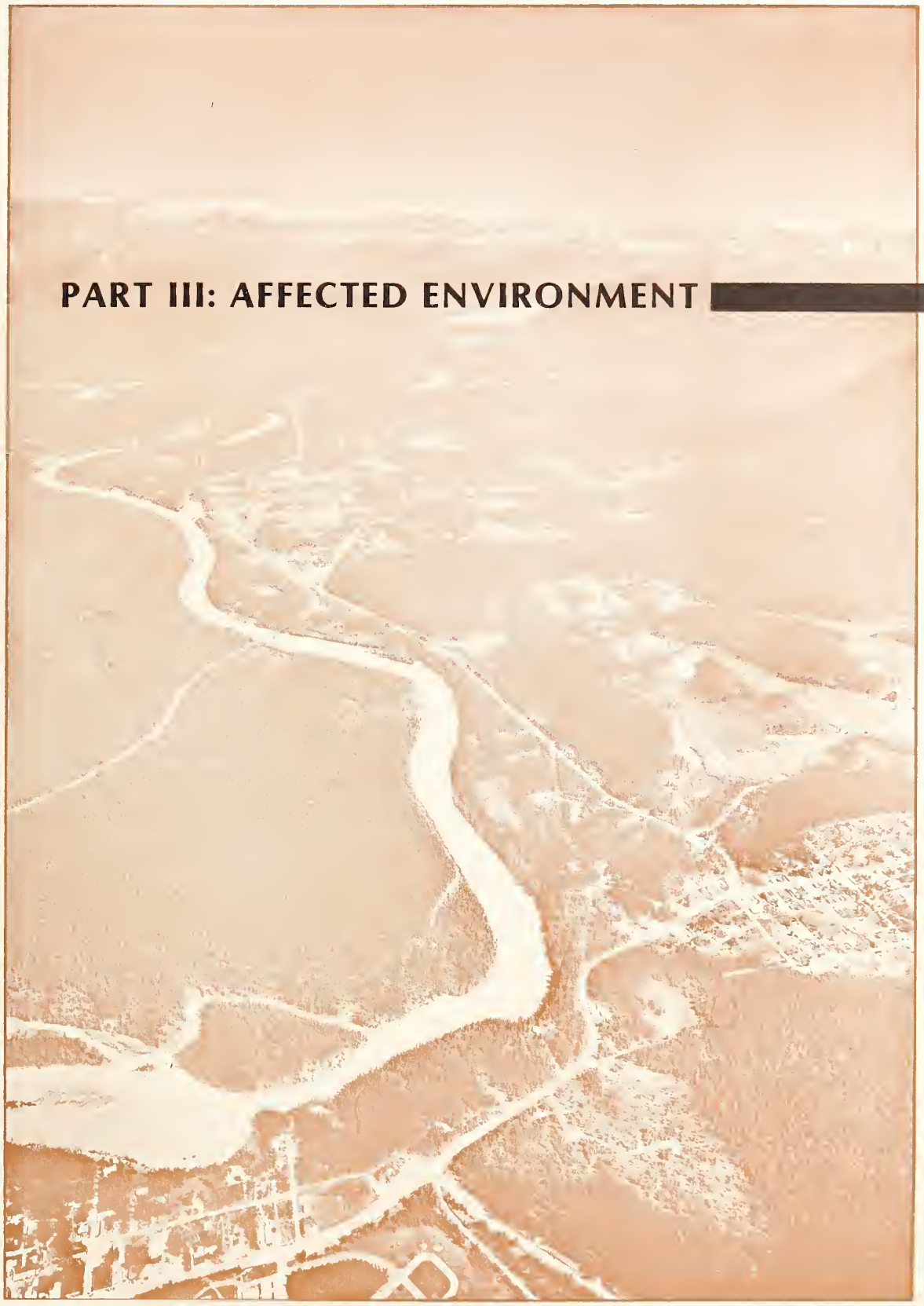
The construction of this project is expected to be accomplished in two separate sections. The earliest that funds will be available to construct the Hungry Horse - Coram section is Fiscal Year 1985, and the earliest that funds will be available to construct the Coram - West Glacier section is Fiscal Year 1987.

REFERENCES FOR PART II

1. Gordon Foley, Supervisor, Land Section, Right-of-Way Division, Montana Department of Highways, in a personal communication, June, 1981.

2. Greg Jackson, Manager, Traffic Unit, Montana Department of Highways, in a personal communication, May, 1981.

PART III: AFFECTED ENVIRONMENT



PART III: AFFECTED ENVIRONMENT

A. INTRODUCTION

Before the environmental impacts associated with the highway alternatives can be accurately assessed, it is necessary to identify the current environmental conditions. The existing environmental conditions were generally categorized for purposes of analysis into the physical, biological, and human environment. Cultural, recreational and visual resources were also considered, as were any particularly environmentally sensitive areas. Within each category, those features judged to be significant and/or required by regulations were addressed. This process required consultation with local and regional environmental experts, review of current literature and documented studies, and the information received at the scoping meetings held at the project locale.

B. PHYSICAL ENVIRONMENT

1. CLIMATE

The study area is located in the mountainous eastern portion of Flathead County, with topography in the area ranging from 3,150 feet near Hungry Horse to over 10,000 feet on a few peaks in nearby Glacier National Park. In addition, large lakes and the deep valleys of the Flathead River are situated in or near the study area. These geographical features produce wide variations in climate within Flathead County and local variations within the study area.

The climate of the upper Flathead Valley is classified as a modified maritime type and is typical of that found in other intermountain valleys of the Pacific slope. Annual precipitation at Hungry Horse and West Glacier is 31.14 inches and 28.06 inches, respectively.[1,2] The average snowfall at Hungry Horse and West Glacier is 108.7 inches and 128.6 inches, respectively.[1] The large volumes of snow that accumulate during the winter rapidly melt during late April or early May, and high stream flows generally occur over a two- to four-week period in the spring. Approximately 60 percent of the annual precipitation falls between the beginning of October and the end of March. Most precipitation generally falls during December and January in the winter and May and June during the spring.

The winter temperatures in the study area average 20 degrees, although several times each winter, cold polar continental air brings subzero temperatures to the area. Summer temperatures are mild, averaging about 64 degrees. Periods of hot weather are also experienced in the study area with daytime maximums most often in the mid-80's to mid-90's. Temperatures will generally remain above 32 degrees for an average of 90 days per year along the project corridor.

2. GEOLOGY & SOILS

a. Geology

The geologic history of the study area began during the Precambrian age over 600 million years ago. During that time, sediments were deposited and compacted to form shales, sandstones and limestones. Since that Precambrian period, the geology of the area has changed dramatically as a result of glaciation during the Cretaceous and Tertiary periods. During the latter part of the Tertiary period, heavy deposits of sand, silt and gravel were deposited into the mountain valleys as a result of the melting outwash of the glaciers that existed in the area. The recent geologic history of the study area is characterized by the deposition of sand, silt, clay and gravel as alluvium along streams and rivers and the weathering of exposed rock and sediments into soil.

Descriptions of the geologic formations likely to be encountered directly as a result of roadway construction or rehabilitation are described below. The locations of these geologic formations in the area are shown on Figure 4.[3]

1) RECENT ALLUVIUM (QUATERNARY)

Alluvium is found along streams and bordering the Middle and South Forks of the Flathead River. The material generally forms bars and flood plain deposits adjacent to present channels. The deposits are generally narrow and thin and commonly overlie glacial till and lacustrine silts. Alluvium consists of clay, silt, sand and gravel from eroded bedrock or glacial parent materials.

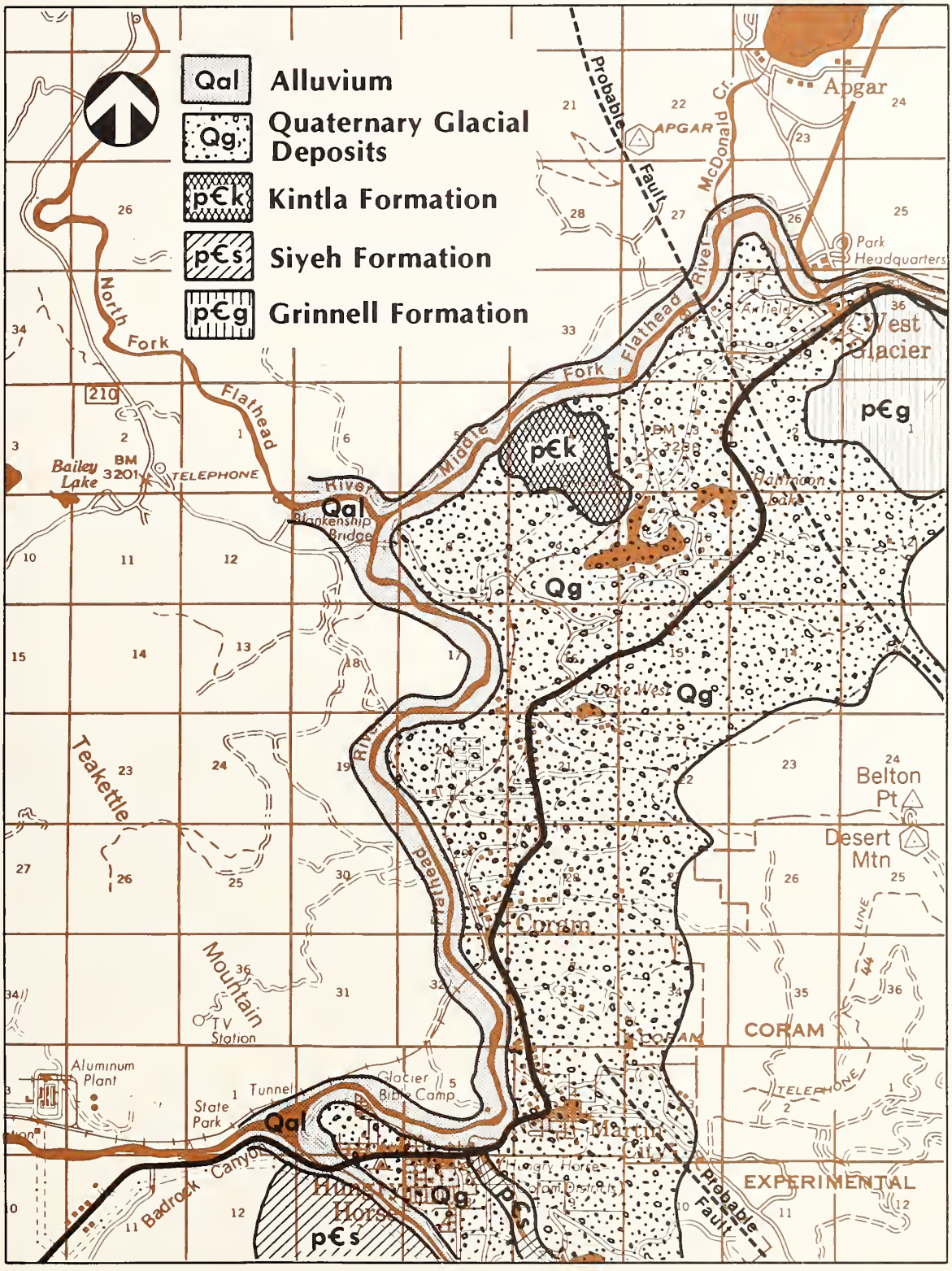


FIGURE 4 – AREA GEOLOGY

2) GLACIAL DEPOSITS (QUATERNARY)

Glacial deposits comprise the major geologic unit that exists in the study area. Extensive deposits consisting of heterogeneous till, glacial outwash, gravels, stratified silt, and lacustrine clays are present along the entire roadway length.

3) SIYEH FORMATION (PRECAMBRIAN)

Rocks are blocky or massive and thick-bedded and consist of gray to blue-gray siliceous limestone and dolomite with some quartzite present. The material weathers to a light gray, gray-yellow, or red-brown, depending on the amount of pyrite present in the bed. The formation forms distinctive cliffs, and varies in thickness from 2,900 feet to more than 5,000. The formation is crossed by the roadway near the intersection of U.S. Highway #2 and the Hungry Horse Dam Road.

4) GRINNELL FORMATION (PRECAMBRIAN)

Rocks of this formation consist of green-gray, purple, and red-purple siliceous argillite (metamorphosed shale) interbedded with siltstone or quartzite. The unit ranges in thickness from 2,500 feet to 4,600 feet. The roadway encounters the formation slightly east of the town of West Glacier.

b. Minerals

Clay materials are found extensively throughout this portion of the Flathead River drainage and were formed by alluvial or lacustrine deposition of sediment by hydrothermal alteration of igneous rock. In addition, small amounts of coal have been produced from beds near the North Fork of the Flathead River. An outcrop of coal is known to exist on the west bank of the Middle Fork of the Flathead River about two miles north of Coram.[3]

The quantities of metallic minerals known to be present in the study area are insignificant. Traces of gold were found in the rivers and streams of the area during the late 1800's. A placer mine was located on the Middle Fork of the Flathead River west of Hungry Horse during the 1890's.

c. Faults

The Flathead fault is located along the west base of the Flathead Range and is described as a northwesterly trending normal fault of late Cretaceous or early Tertiary age (approximately 75 million years ago). The Flathead fault extends from just west of West Glacier southeast for more than 100 miles. The east block of this fault was displaced between 5,000 and 15,000 feet upward. The Tuchuck fault is thought to be the probable northwest continuation of the Flathead fault. The Tuchuck fault is a normal fault extending from Canada to the Middle Fork of the Flathead River, where it is believed to join the Flathead fault. Total displacement of the fault is estimated to be about 9,000 feet.[3]

d. Earthquake Hazard

The seismic risk map developed in 1969 by the National Oceanic and Atmospheric Administration Environmental Research Laboratories classifies the study area as a Zone 2 risk (moderate earthquake damage is expected). The study area has not been subject to any major earthquakes (greater than magnitude 6.9 on the Richter Scale) in recent times.[4]

e. Landtypes / Soils

Soils within the study area are associated with three major landforms which include: 1) depositional landforms resulting from fluvial or glacial processes; 2) erosional landforms resulting from weathering processes; and 3) breakland landforms resulting from structural processes and modified by glacial or fluvial action. A discussion of soils associated with each landform likely to be encountered during roadway construction is included in the following narrative. Figure No. 5 shows the location of each landform and associated soil.[5,6,7]

1) ALLUVIAL SOILS (10-2, 10-3)

These soils are found within the flood plains of the Flathead River and Abbot Creek. The soils consist of clay, silt, sand and gravel. The soils are moderately well drained (10-2) to somewhat poorly drained (10-3). The moderately well drained soils (10-2) have no limitations or slight limitations for road building. The poorly drained soils (10-3) have severe limitations for road building due to the concentration of shallow groundwater. Slopes range from 0 to 20 percent.

2) THICK, FIRM GLACIAL TILL (26C-7)

The soils of this land type occur in a complex of silty, loamy and sandy textured material which developed from argillites, siltites and quartzites. The subsoils may be mildly calcareous in some locations. Soils are generally well drained and slight limitations exist for road building. The soils occur on gently sloping to rolling ground moraines (0 to 20 percent slope) associated with valley glaciation.

3) THICK, REWORKED GLACIAL TILL (27-7, 27-8)

These soils occur on nearly level to gently rolling stream terraces and result from glacial till deposits being reworked by stream action. The soils are coarse-textured and non-stratified. Subsoil consists of gravel and very gravelly loamy sand. Slight limitations exist for road construction. Slopes range from 0 to 40 percent.

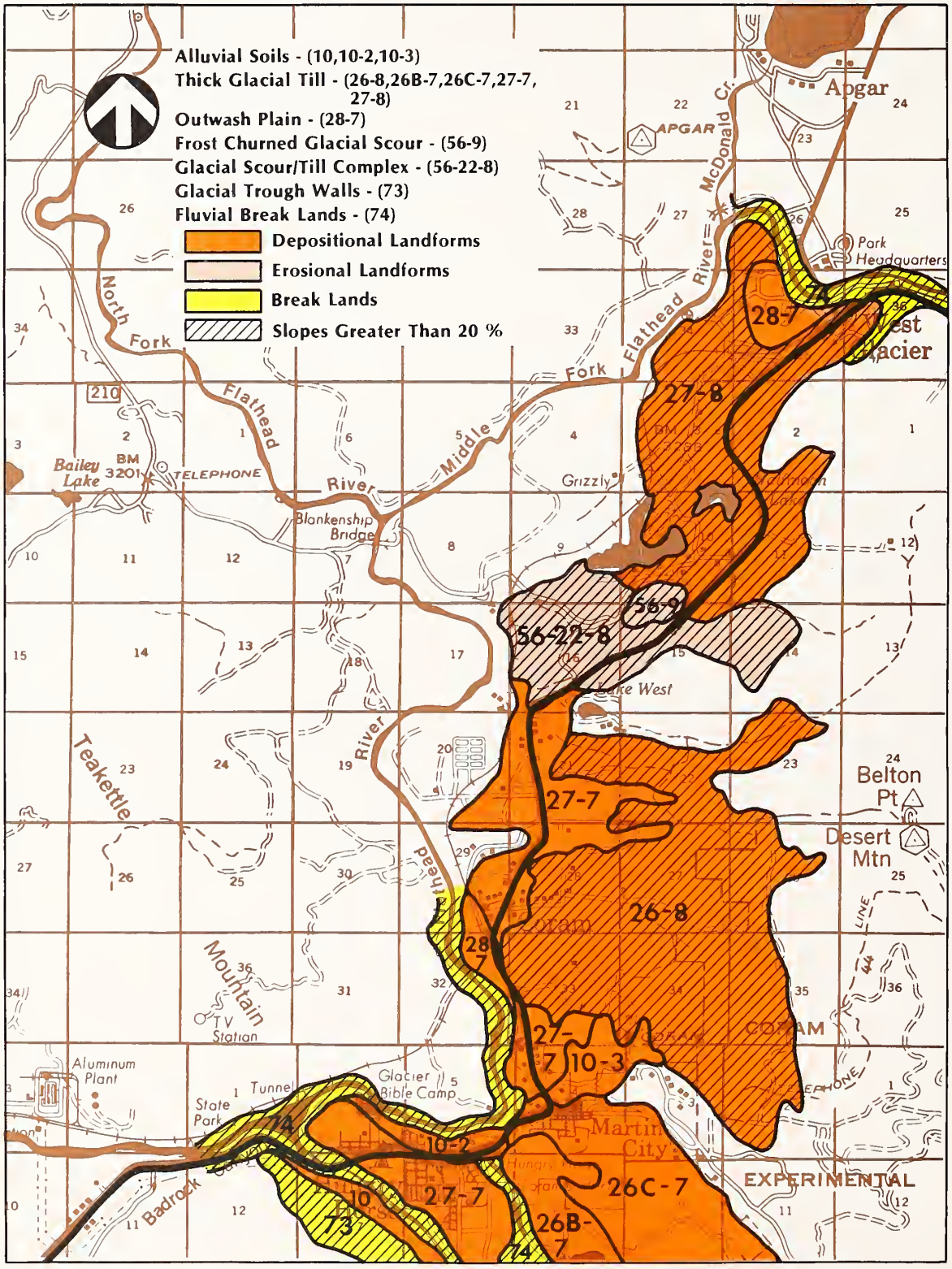


FIGURE 5–LAND TYPES & SOILS

4) OUTWASH PLAINS (28-7)

These soils occur on gently sloping terrain deposited by glacial meltwater. The soils in the outwash plains are stratified and consist of silts, sands and gravels. Soils are generally well drained and have slight limitations for road building. Slopes range from 0 to 20 percent.

5) GLACIAL SCOURED LAND/TILL COMPLEX (56-22-8)

These soils consist of a complex of thin glacial till and frost-churned glacial scoured land. The soils are shallow to moderately deep and have a subsurface of fractured limestone or argillite. Road construction projects have slight limitations due to shallow bedrock and possible cut bank instability. Soils occur on slopes of up to 60 percent.

6) FLUVIAL BREAKLANDS (74)

These soils occur on slopes formed by rapid downcutting stream actions. The coarse-textured soils vary in thickness and are underlain by glacial till or bedrock. Severe limitations exist for road building due to areas of shallow bedrock and because of stream bank erosion. Slopes are adjacent to streams and may exceed 60 percent.

f. Prime and Unique Farmlands

No prime or unique farmlands exist within the study area. The temperature regimes of area soils are not favorable for producing sustained high crop yields.[8]

3. WATER RESOURCES & QUALITY

Water resources within and adjacent to the highway corridor include both surface water and groundwater regimes. Surface water resources in the area include lakes, ponds, creeks, and rivers. Extensive studies of the area's water resources have been performed and documented in the past several decades by various governmental agencies and academic institutions, including the U.S. Forest Service (USFS), U.S. Geological Survey (USGS), U.S. Environmental Protection Agency (EPA), Montana Department of Health and Environmental Sciences (MDHES), Montana Department of Natural Resources and Conservation (DNRC), and departments of the Montana university system. The results of these investigations have been used in the compilation of the following comments.

a. Surface Waters

The surface water resources near the highway corridor are shown in Figure 6. The entire area lies west of the Continental Divide within the Flathead River drainage. The surface waters of the area consist of the Flathead River and tributary streams, and several lakes and ponds.

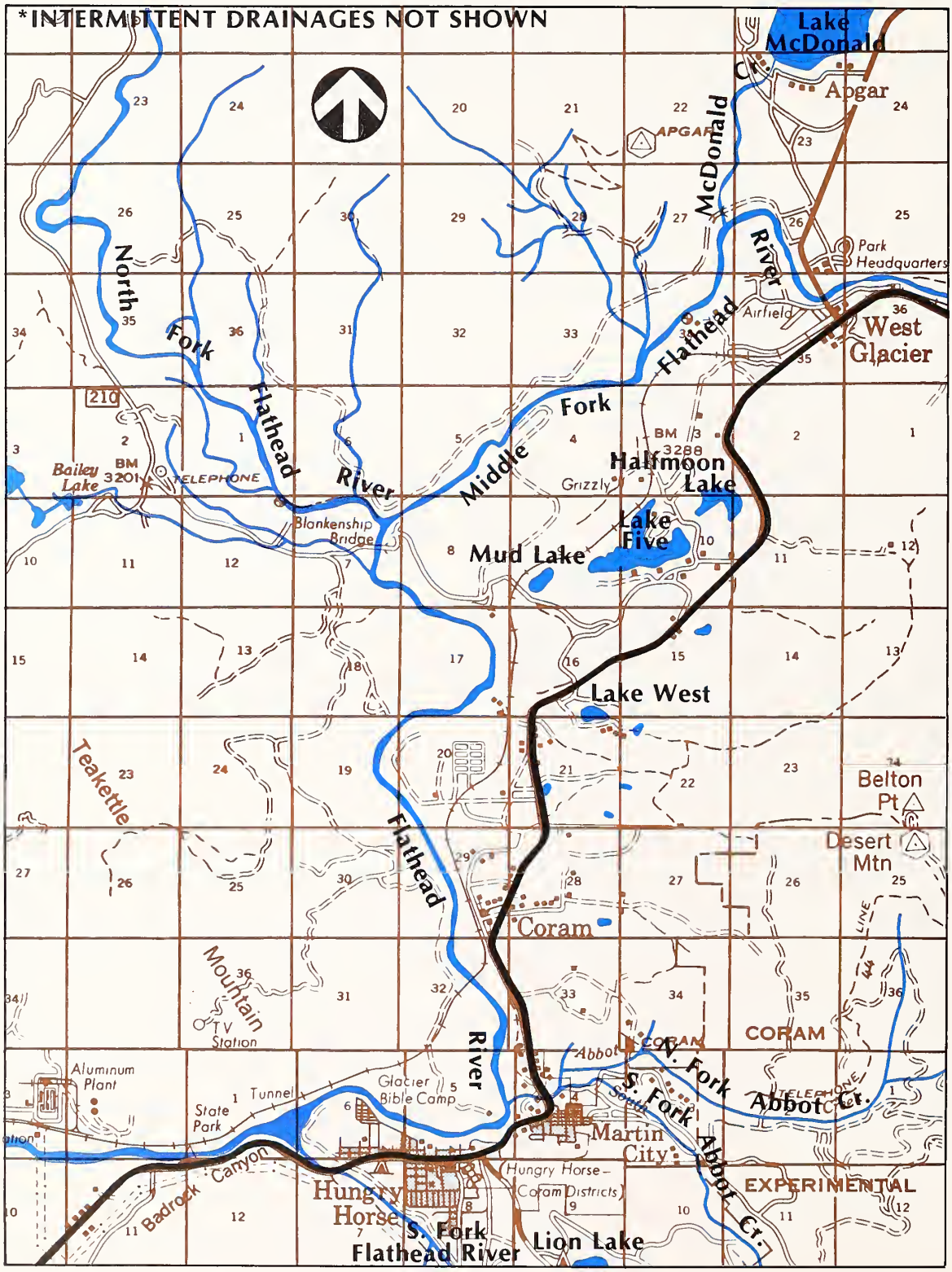


FIGURE 6–SURFACE WATER RESOURCES

Of the surface water resources discussed in this section, several can be excluded from consideration because of their remoteness from the study corridor. The surface water resources which may be impacted by the proposed project are discussed in this section.

1) MIDDLE FORK AND MAINSTREAM OF THE FLATHEAD RIVER

The Middle Fork of the Flathead River is a free-flowing river draining a 1,128-square-mile watershed and is designated B-1 by the Montana Department of Health & Environmental Sciences. A definition of the B-1 classification is contained in the Glossary. Average flow at the mouth of the Middle Fork is approximately 3,000 cfs.[9] The stream occupies a rugged canyon, and the channel is typically located in bedrock or alluvial gravel. At West Glacier, the canyon widens and the river channel traverses alluvial gravel deposits 50 feet deep or more. The surrounding watershed is characterized by sharp topographic relief, and is densely forested.

The mainstream of the Flathead River, beginning at the junction of the North and Middle Forks, is of similar characteristics. The average discharge of the mainstream increases to approximately 6,000 cfs when the North Fork watershed contribution is added.[10] The stretch of the mainstream that parallels the highway corridor is characterized by a gravel bottom and free-flowing, cold water conditions.

Due to the continuity of the Middle Fork of the Flathead River into the mainstream of the Flathead River, little difference in water quality between the two reaches of the stream is evident. The quality of both the Middle Fork and the mainstream of the river in the vicinity of the highway corridor is well documented by USGS and MDHES data taken from the Middle Fork near West Glacier.[11] Suspended solids and sediment in the river are generally low except during major runoff events. The water temperature is consistently low and the dissolved oxygen concentration remains high, supporting a substantial trout fishery. Trace concentrations of heavy metals and organic pesticides are low, in many cases below detection limits. Chlorides, organic salts, coliform organisms, nitrates, and ammonia nitrogen concentrations are all low, indicating the absence of appreciable sewage and agricultural runoff contamination.

The flow of the Flathead River constitutes the major input to Flathead Lake. The lake is an oligotrophic (deficient in nutrients with abundant dissolved oxygen) or mesoligotrophic (moderate amount of dissolved nutrients) water body. The lake is presumed to be phosphorous-limited, and any unnatural influx of phosphorous to either watercourse is of concern from the standpoint of potential eutrophication.[12]

2) ABBOT CREEK AND INTERMITTENT STREAMS

Abbot Creek is a small, ungauged stream draining a 16-square-mile mountainous area. The channel of Abbot Creek proper extends approximately four miles due east of Martin City, while the south fork of Abbot Creek traverses over five miles. The streambed is primarily bedrock and gravel, and the stream is suitable trout habitat.

The intermittent streams in the vicinity of the highway corridor can be generally characterized as avenues for temporary runoff from snowmelt and rainfall. These streams are tributaries to perennial watercourses in the area, and generally drain individual small watersheds of less than two square miles. Due to their intermittent nature, fisheries or recreational activities on these streams are limited.

The quality of the waters of Abbot Creek and other small, intermittent streams of the corridor area is generally good, and these watercourses are likewise designated B-1 by the MDHES. Abbot Creek is characterized by low temperatures, limited nutrients, high dissolved oxygen concentration, moderate hardness and alkalinity, and low turbidities except during major runoff.[13] The gravel and sand bed of the creek channel substantiates these characteristics and the potential of the stream to support trout and other cold-water fish species and the propagation thereof.

The intermittent streams in the area carry appreciable sediment during times of peak runoff, with the clarity and quality of their waters improving as their water levels recede. Since these watercourses rely on runoff for their flow, they are generally dry during late summer and fall months.

3) SMALL LAKES

There are several small lakes that are adjacent to the corridor. The small lakes that are nearest to the corridor include Lake Five, Halfmoon Lake, Mud Lake, Lake West, and Lion Lake. For the most part, these lakes tend to be quite shallow with depths primarily less than 20 feet and with sandy or gravelly bottoms. The water quality in these lakes is generally good; however, increased recreational use in recent years has resulted in some reduction in water quality due primarily to domestic sewage from septic tanks entering the lakes.[14]

b. Groundwater

The highway corridor is generally underlain by alluvial groundwater at shallow to moderate depths. No major aquifer underlies the area; however, sands and gravel deposited as alluvium of the Flathead River underlie much of the valley floor in the area and contain groundwater in appreciable quantities.

An inventory of the domestic well logs in the corridor area on file with the Montana DNRC indicates that groundwater in quantities sufficient for domestic use is found at depths ranging from approximately 22 feet to over 150 feet, depending on location. In general, shallower depths to groundwater are associated with the northern end of the corridor as compared to the southern end. Yields from individual wells are generally moderate, in the range of 10 to 30 gallons per minute. Two of the communities along the corridor use well sources for at least a portion of their municipal water supplies.

Because of the close relationship between the groundwater along the corridor and the adjacent surface waters, the qualities of both are very similar. As indicated by quality assays from individual wells in the area, the same moderate hardness and alkalinity evident in the surface

waters is also common to the groundwater.[15] The amounts of hardness and alkalinity in the groundwater often exceed those concentrations found in the surface waters, as might be expected due to leaching of soluble salts and minerals from underlying rock strata.

Other contaminants in the groundwater of the area are scarce. Nitrates and phosphates are generally lacking, as are heavy metals. The bacteriological quality of the groundwater is reportedly good.[16]

Existing impacts to the groundwater resources of the corridor area are generally limited and in most cases related to residential development. A significant number of domestic and community wells are in use along the corridor, but recharge to the groundwater of the area occurs rapidly enough to keep pace with the present level of water use. The most significant impact occurring at present involves the scattered drainfield systems used to dispose of septic tank effluent.[17] Particularly in those areas where comparatively intense development has concentrated such facilities, the potential exists for groundwater contamination from drainfield seepage. Such occurrences have been suggested at Lake Five; if the lake is suffering from such contributions, the adjacent groundwater may be similarly affected. (Tom Cowan, Flathead County Sanitarian's Office, May, 1981)

4. AIR QUALITY

The proposed project is within the Flathead River Basin, which has a high quality natural environment. The study area along the proposed project is rated as Class II under the federal Prevention of Significant Deterioration of Air Quality Act (Public Law 95-95). Two areas in the region which are designated as Class I are parts of Glacier National Park and the Bob Marshall Wilderness. (The Class I designation is reserved for certain national parks and wilderness areas and contains the most stringent air quality standards. Class II areas include almost all other areas in Montana and have somewhat less stringent requirements than Class I.) The closest problem area for pollution is Columbia Falls, which is rated as a non-attainment area for total suspended particulates.[18] There has also been a fluoride pollution problem in the Columbia Falls area near an aluminum reduction facility. The principal source of air pollution in the study area is traffic generated, although home heating and carry over from the aluminum reduction facility contribute to the pollution in the area.[19]

Motor vehicle pollutants contain both toxic compounds and organic materials that in themselves are not detectable, but which react in the atmosphere to form smog. In addition, objectionable smoke and odor, separately or together, may accompany exhaust emissions. Operation and maintenance of a roadway generate both particulate and gaseous emissions. Gaseous emissions are the principal transportation-related source of pollutants degrading air quality. These include carbon monoxide (CO), unburned hydrocarbons (HC), oxides of nitrogen (NOx), and oxides of sulfur. Excessive concentrations of these materials in the atmosphere are detrimental to human health, wildlife, vegetation, water quality, and climate.[20]

Inversions in the area occur most nights in all seasons and are often present throughout the day during winter months. Poor ventilation accentuates the impact of present emission sources. Slow dispersion rates serve to localize impacts to the area immediately around a source.

The Montana Department of Health & Environmental Sciences, Air Quality Bureau (AQB) has monitored particulate levels, particle size, sulfates, nitrates, and visibility in the Flathead River Basin. No measure was made for carbon monoxide or hydrocarbons, nor was any determination made on the levels of sulfur oxides or nitrogen oxides. However, prediction models based on existing traffic indicate that carbon monoxide concentrations do not exceed national ambient air quality standards, and air quality is not an environmental problem in this area.

5. NOISE

A majority of the study area is typical of a rural forest setting, with present noise due mainly to traffic along U.S. Highway #2. Noise measurements were made at 17 locations on June 30 and July 1, 1981 to determine present noise levels. Measurements were made at 15-minute intervals at various distances from the roadway and at various times during the day. Sites were selected to determine the effect the proposed project would have on residences, motels, campgrounds, and other sensitive land uses. Figure No. 7 shows the site locations where noise measurements were taken. The results of the measurements were determined according to the category L_{10} (defined as that level of sound exceeded ten percent of the time). Sound levels in the study area were affected by traffic on the roadway under study, traffic on other roadways, airplanes, trains, and other human activity. Environmental factors influencing the measurement of the sound levels included meteorological conditions and natural topography.

Measurement of the sound levels was made by recording noise at each location using a tape recorder, microphone and sound level meter. Recorded noise for each site was then analyzed with a Noise Level Recorder and a Statistical Distribution Analyzer.

Noise for traffic studies is normally measured in dBA. The acute threshold of hearing is 0 dBA, and the threshold of pain is 140 dBA. The ear generally perceives a sound level change of 3 dBA as barely noticeable, 6 dBA as a significant increase, 10 dBA as twice as loud, and 20 dBA as very much louder.[21] The FHWA design noise level for land uses along the corridor is 70 dBA.[22]

The three major components of highway noise are engine noise, exhaust noise, and tire noise. These are dependent on speed, acceleration, grade, and roadway condition. Engine and exhaust noise are the primary source of noise for vehicles at slower speeds and tire-roadway interaction for vehicles at higher speeds. Large diesel trucks produce the loudest traffic noise. Traffic mix, i.e. the number of automobiles, medium trucks, and heavy trucks, is important when measuring and predicting L_{10} noise levels, since each type of vehicle generates a different level of sound.[21]

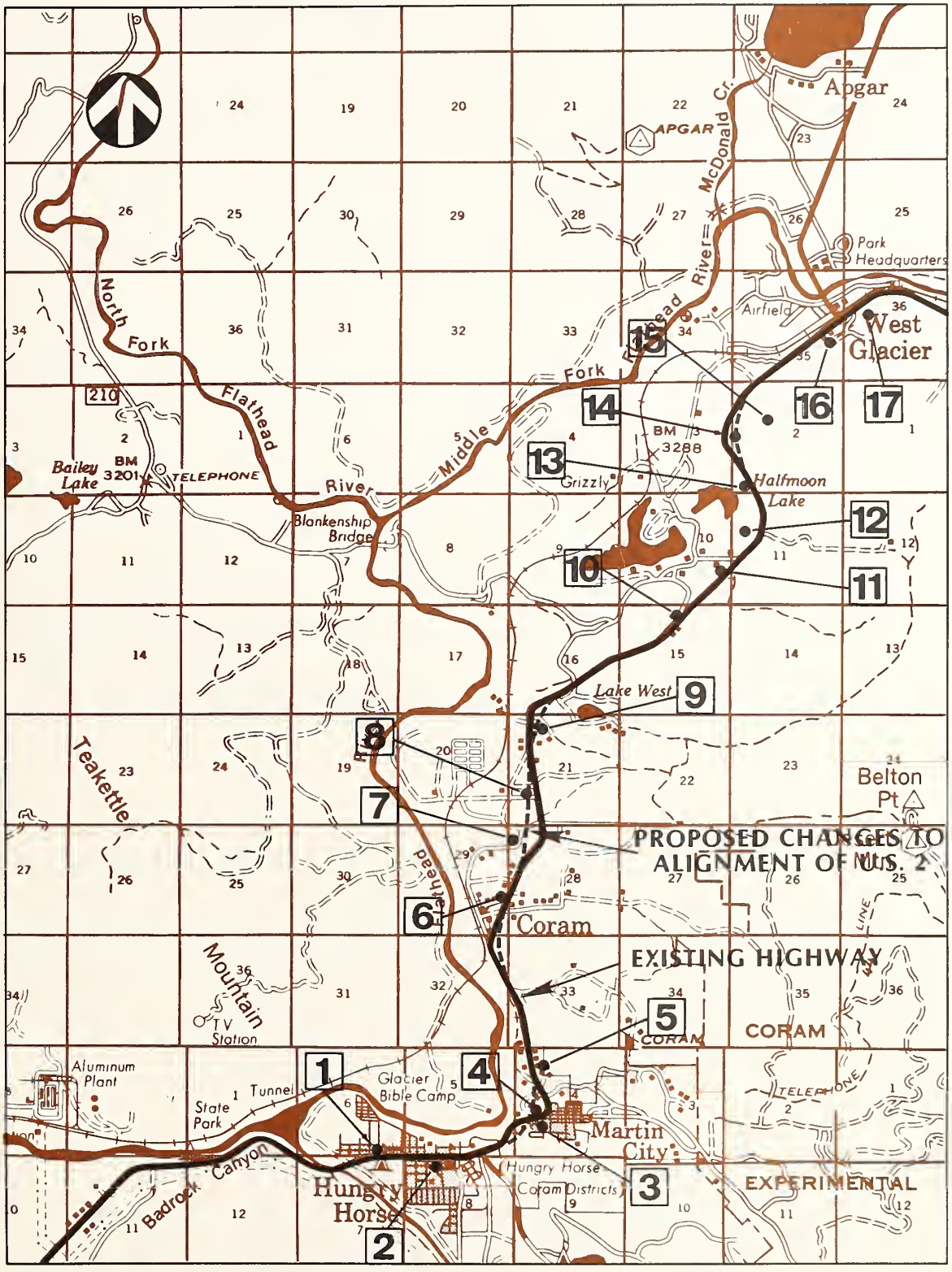


FIGURE 7–NOISE MONITORING LOCATIONS

Traffic volume varied throughout the measuring period; therefore, L_{10} values were adjusted for the 30th highest hour volumes determined for several locations along the highway under study. Traffic mix was based on actual counts made and on recommendations given by the Montana State Department of Highways. The percentages used were 90 percent for automobiles, 7 percent for medium trucks, and 3 percent for heavy trucks.

Predictions of present noise levels were made using the manual method of the FHWA Highway Traffic Noise Prediction Model presented in FHWA-RD-77-108. The manual method involves the use of a series of charts and graphs to compute the predicted L_{10} sound levels.[21]

TABLE NO. 4

PRESENT NOISE LEVELS (1981)

SITE NUMBER	HOURLY VOLUME COUNTED	PRESENT 30th HIGHEST HOUR VOLUME	MEASURED L_{10} dBA	*L_{10} ADJUSTED 30th HR. VOLUME	PREDICTED L_{10} FOR 30th HR. VOLUME
1	320	707	69.2	73	71
2	332	637	69.2	72	69
3	372	637	58.9	61	62
4	328	637	57.4	60	58
5	356	579	65.2	67	66
6	324	523	61.2	63	61
7	Not Counted	523	57.2	-	53
8	Not Counted	483	54.5	-	59
9	344	483	58.5	60	60
10	528	483	68.8	69	67
11	356	493	61.3	63	62
12	320	493	56.2	58	61
13	380	493	61.8	66	67
14	268	493	62.8	65	65
15	Not Counted	511	49.9	-	50
16	308	511	59.5	62	64
17	144	212	77.9	80	66

* L_{10} (Adjusted) = L_{10} (Measured) + 10 LOG (Peak Hour Volume/ Counted Volume)

Noise levels from traffic decrease with increasing distance from the roadway. This phenomenon is referred to as the Drop-Off Rate, which is expressed in terms of decibels per doubling of distance (dBA/DD). The drop-off rate is related to ground conditions, interference with the path of sight from the source to the receptor (such as forests), topography, and meteorological conditions.[21] A drop-off rate of 5.89 dBA/DD was determined from the adjusted, measured noise levels. A plot of the predicted noise levels indicates a drop-off rate of 5.82 dBA per doubling of distance, which corresponds very closely to the measured levels.

The procedure used for this analysis was to take actual noise measurements in the field and compare them to predicted noise levels to determine if the prediction model was accurate. Future noise levels could then be estimated using the prediction model. Comparisons of measured levels and predicted levels, as shown in Table No. 4, indicate the correlation between the two procedures. Most predicted values are within 3 dBA of measured and adjusted values. A 2 to 3 dBA difference in traffic noise would not be significant. The measured value (80 dBA) at Site No. 17, which is located next to a hotel at West Glacier, was high because of the passage of a train during the measuring period. The measured noise level at Site No. 7 was affected by wind, giving a higher measured value than the predicted value. All other values compare closely and thus the data indicates that the FHWA prediction model is accurate for this study area.

Based on these measurements and calculations, highway noise is a significant but not a serious environmental problem.

6. FLOOD PLAINS

The topography along the highway corridor governs the occurrence and extent of floodplains in the area. Due to the relative sparsity of development in the vicinity of the corridor, no Army Corps of Engineers or HUD Federal Insurance Administration floodplains are designated for the Flathead River or other drainages in the area. However, the U.S. Soil Conservation Service has delineated flood-prone areas in the locality based on the June, 1964 flood. This flood is considered by the U.S.G.S. to exceed a 50-year flood event by two to four times. The flood-prone area map is on file at the Montana Department of Natural Resources and Conservation - Flood Plain Management Section.[23]

Those areas proximate to the study area that have been classified as flood-prone are generally confined to the immediate corridor of the channels of the Middle Fork and mainstream of the Flathead River. Depending on the adjacent topography, a continuous corridor ranging in width from approximately 300 to 1,200 feet has been designated as flood-prone along the river channel. The Abbot Creek drainage

immediately north of Martin City is similarly designated; this flood-prone area crosses the existing highway immediately adjacent to the stream crossing. Some additional small flood-prone areas have been identified along intermittent streams in the vicinity of Coram and Martin City. Two such areas encroach into the east side of the study area corridor, and the diking effect of the existing roadway appears to contribute in a limited way to the potential for flooding. The area immediately adjacent to Mud Lake also bears the DNRC flood-prone designation.

Substantial data is on record with the USGS for the June, 1964 flood along the Flathead River, an event determined to be far in excess of the 100-year flood event.[24] High water elevations for this flood are published for several locations adjacent to the highway corridor. These elevations are well below the roadway elevation of the existing highway, at all points along the corridor. Since the existing highway does not occupy any portion of the projected flood plain of the river, its presence is not contributing to the high water elevations of the Flathead River. The proposed improvements will have a slight encroachment into the flood plain of the Flathead River between Martin City and Coram, and will cross the flood plain at Abbot Creek. These locations are illustrated in Figure 9, "Biological Environment Location Map".

C. BIOLOGICAL ENVIRONMENT

1. VEGETATION

The proposed highway construction project between the communities of Hungry Horse and West Glacier, Montana lies within a vegetative zone that has been broadly defined as the boreal forest.[25] Figure 8 identifies the locations of the various vegetative habitat types in the project area. The boreal forest is dominated by coniferous trees and extends south out of Canada into the northern Rocky Mountains. In the Hungry Horse - West Glacier area, the boreal forest is influenced by warm, moist Pacific weather patterns and the dominant coniferous tree species are Douglas fir (Pseudotsuga menziesii), Engelman spruce (Picea engelmannii), western hemlock (Tsuga heterophylla), western red cedar (Thuja plicata), subalpine fir (Abies lasiocarpa), lodgepole pine (Pinus contorta), and western larch (Larix occidentalis).

Fire has played a major role in the development of the forest communities in this area since Pleistocene times. As a consequence, fire-dependent species such as lodgepole pine and western larch dominate large portions of the region. In the late 1920's and early 1930's, a series of major fires decimated the Hungry Horse - West Glacier area, removing much of the existing vegetation and resulting in the extensive, even-aged stands of lodgepole pine now visible in the area.[25]

A few minor riparian areas, such as Abbot Creek, do occur in the area. They are dominated by thin-leaf alder (Alnus incana), willow (Salix spp.), and paper birch (Betula papyrifera).

PROPOSED CHANGES TO ALIGNMENT OF U.S. 2
EXISTING HIGHWAY
310
470
570
620
250
530
290
199
SOUTH FORK FLATHEAD RIVER
Lake Five
Hellroaring Creek
Logan Creek
Kintla Lake
Bowman Lake
Quartz Creek
Huffmoon Lake
Huffmoon Lake
Kishenehn Creek
Kishenehn Creek
Kishenehn Creek

There are a few marshy areas adjacent to the existing highway that are dominated by sedges (Carex spp.) and various grass species (Glyceria spp., Calamagrostis spp., etc.).

2. WILDLIFE

An investigation of the wildlife species that may be found in the project area was made. This investigation attempted to identify the wildlife species that either live in or migrate through the project area, the winter range and feeding areas located in close proximity to the proposed highway alignment, and current areas that are significantly used by wildlife for crossing the existing roadway. The various wildlife environment areas of interest are shown in Figure 9.

In order to assemble the appropriate information, the project corridor was walked by a wildlife biologist to establish wildlife use of the area adjacent to the highway and locations where significant numbers of wildlife were crossing the existing highway. In addition to this field work, a review of the literature as well as interviews with local residents and state and federal biologists were conducted. No wildlife crossings were identified which were sufficiently localized or used intensely enough to justify wildlife barriers and/or underpasses. Therefore, the data presented in Figure 9 represent estimates based on available literature and the experience and knowledge of biologists familiar with the conditions near the project area.

As indicated in Figure 9, there is only one stream with viable fish habitat that crosses the proposed highway alignment. This stream is Abbot Creek which is located immediately north of Martin City. Rainbow and cutthroat trout spawn in this creek.[26] In regard to the wildlife in the area, particular attention should be paid to the bald eagle, peregrine falcon, grizzly bear and wolf, which are considered endangered or threatened species. Of these species, only the bald eagle and grizzly bear are known to frequent the area.[27] Other wildlife species that occur in the area but that are becoming generally less common include marten, wolverine, and elk. There are numerous other wildlife species that have been observed in the project area other than those species listed above. A complete listing of these species is included in the technical files compiled for this project and available at the Montana Department of Highways office in Helena.

3. WETLANDS

In order to document the wetland areas within the study area, the corridor was field-inventoried for marshy areas, and in addition, several biologists were consulted. It was determined that the alignment of the proposed highway crosses one perennial stream (Abbot Creek), one intermittent stream stream with no wetlands, one intermittent stream with adjacent wetlands, and one marshy area. Since Abbot Creek and one of the intermittent streams have well-defined banks with no wetlands, neither of the crossings at these locations will have an impact on wetlands.

The intermittent stream with adjacent wetlands is located approximately one mile north of Coram. The largest wetland area on this intermittent stream lies east of the highway, as is shown on Figure 9. In this area sedges (Carex spp.) are dominant, with various grass species (Glyceria spp., Calamagrostis spp., etc.) also present. In the proposed area of crossing, the stream and adjacent wetland are approximately 100 feet wide. The proposed alignment is approximately 600 feet to the west of the existing highway, which would move traffic away from the largest wetland area on this intermittent stream.

The marshy area along the highway is located on both sides of the highway near the Blankenship Road turnoff, as shown on Figure 9. The only area that would be affected by any of the proposed alternatives is the small wetland area (approximately one acre) on the east side of the highway.

These wetlands serve as minor wildlife habitat areas and may provide some sedimentation and other pollution removal function for runoff.

D. HUMAN ENVIRONMENT

1. POPULATION

The historic population of Flathead County and of the South Fork Census Division of Flathead County is outlined in Table No. 5. The South Fork Division includes each of the communities under study (Hungry Horse, Martin City, Coram and West Glacier) as well as a large expanse of more rural, and in many cases remote land surrounding these communities. Approximately four percent of the total county population resides in the South Fork Division. The growth rate of the South Fork population has been approximately 14 percent in each of the last two decades and has been significantly less than the overall rate for the county.[28]

TABLE NO. 5

AREA POPULATION

	FLATHEAD COUNTY		SOUTH FORK DIVISION	
YEAR	POPULATION	% CHANGE*	POPULATION	% CHANGE*
1950	31,495	+29%	--	--
1960	32,965	+4%	1,547	--
1970	39,460	+20%	1,759	+14%
1980	51,966	+32%	2,000	+14%

* From previous census

Source: U.S. Department of Commerce, Bureau of the Census

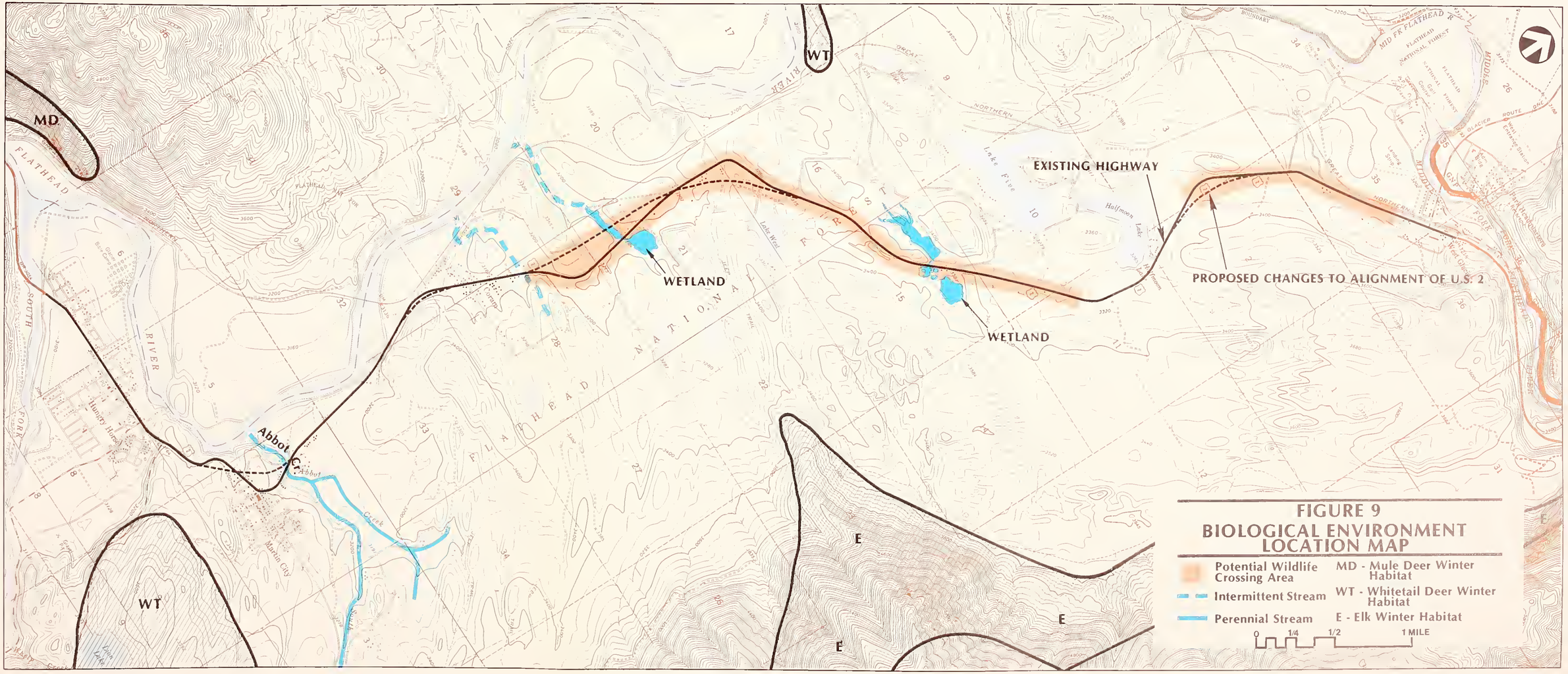

MD
WT
WETLAND
WETLAND
EXISTING HIGHWAY
PROPOSED CHANGES TO ALIGNMENT OF U.S. 2
Abbot Cr.
WT
E
E
E
FIGURE 9
BIOLOGICAL ENVIRONMENT
LOCATION MAP
Potential Wildlife Crossing Area
Intermittent Stream
Perennial Stream
MD - Mule Deer Winter Habitat
WT - Whitetail Deer Winter Habitat
E - Elk Winter Habitat
0 1/4 1/2 1 MILE

Figure 10 illustrates the current population distribution through the project corridor. Also indicated on this figure are the most probable future growth areas in and around each of the communities. These are the areas that are expected under the current roadway conditions to increase in population as the area grows. Based on the evaluation of various sources of information, it is reasonable to estimate that populations in the South Fork Census Division will increase at about the same amount as the growth experienced in the 1960's and 1970's. This would result in a population increase of about 22 people per year to a population of approximately 2,440 by the year 2000.[29]

2. HOUSING CHARACTERISTICS

In the decade of the 1970's, total numbers of housing units increased at a more rapid rate than did total population. As recorded by the 1980 census, there are 22,485 housing units in Flathead County. This total is 60 percent greater than the total number of units ten years earlier. The 1980 census showed a housing count of 1,400 housing units in the South Fork Census Division. The South Fork Census Division did not have housing counts prior to the 1980 census and thus a comparative number for earlier census years is not available. While substantial population growth occurred in the South Fork Division during the last ten years, it is very likely that the number of housing units did not grow at the same rate as that of the County as a whole.[30]

Due in large part to the number of vacation or seasonal housing units in the South Fork Division, the average number of persons per housing unit is considerably lower in this Census Division than in the County itself. The trend throughout Flathead County, however, has been toward a decreasing number of persons per housing unit. This trend is national in scope and was due in large part to the rapid growth in housing in the 1970's, while at the same time, family sizes were shrinking.

A check with the Flathead County Planning Office shows that 95 lots encompassing nearly 67 acres have recently been platted and approved for subdivisions in the corridor area. These lots are primarily located near Hungry Horse, Coram, and West Glacier. Recently a substantial number of lots have been developed outside the immediate four principal communities in the area. Considerable private property remains available for development if market conditions were favorable and the owners were interested in residential development.

A housing unit forecast for the South Fork Census Division was developed based on research conducted for this project. This projection is based on the expectations for all of Flathead County, since historical data for the South Fork Division is not available. The forecast shows a 1990 total in the South Fork Division of 1,466 housing units, an increase of 66 units in ten years, and a year 2000 estimate of 1,603 housing units, an increase of 203 units in twenty years. This forecast is below the rate of growth that has been experienced in recent years and these housing estimates are considered probable lower limits.

3. LAND OWNERSHIP AND LAND USE

a. Land Ownership

Figure 11 illustrates the land ownership in the general vicinity of the project and the split between government land and privately owned land. Considering an area extending approximately one mile on either side of the highway with the Middle Fork of the Flathead River as the western boundary, there are approximately 12,000 acres within the study corridor. Of this total, the U.S. Forest Service owns approximately 4,500 acres, or 38 percent of the total. Of the remaining 7,500 acres, 4,300 acres are privately owned and undeveloped at this time. The remainder, or approximately 3,200 acres, is land which is already in use for residential, commercial, and recreational purposes (including lakes and streams).

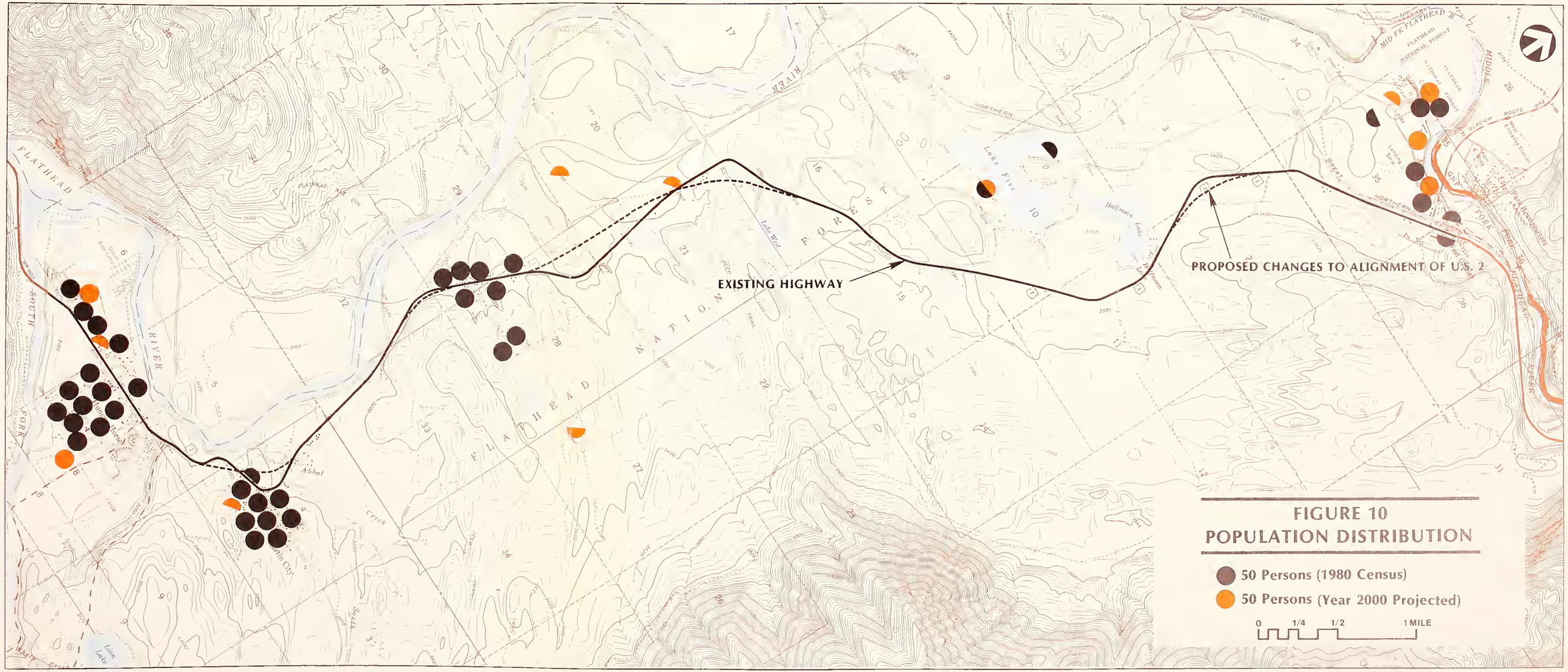
Other than the South and Middle forks of the Flathead River and its tributaries, the other sizable bodies of water in this corridor include Lake Five, Halfmoon Lake, and Lake West. All of these bodies of water lie between West Glacier and Coram.

With much of the privately owned land in this area currently undeveloped, it is evident that the potential exists for some major land use changes. However, recent trends and current plans do not indicate that private development will occur in this area any more rapidly than it has over the past several decades. Such growth has been slow and, for the most part, responsive to major economic impacts in the Flathead Valley and the tourism related to Glacier National Park.

b. Land Use

The corridor along Highway #2 from Hungry Horse through Martin City, Coram, and on to West Glacier is best described as a forested primary highway. There is little agriculture, and the communities are small and consume relatively small amounts of land area. The corridor area business base is strip-type alongside the highway for the most part, with only 43 separate businesses located in the study area.

Since the economy of the area is particularly dependent upon tourism, it is not surprising that the principal use of roadside land is light commercial in nature. Tourist-oriented gift shops, restaurants, bars, and camping services occur in small clusters along U.S. #2 between the corridor communities. A moderate amount of residential development has occurred in the corridor, except for a larger concentration in the Lake Five vicinity. Although there has been a recent increase in subdivision activity in the Hungry Horse, Martin City, Coram and West Glacier areas, most of the homes in the area were built prior to 1970. As indicated in the housing section, new residential development outside of the established towns is expected to occur near West Glacier, in Hungry Horse, and north of Coram.


EXISTING HIGHWAY
PROPOSED CHANGES TO ALIGNMENT OF U.S. 2
FIGURE 10
POPULATION DISTRIBUTION
50 Persons (1980 Census)
50 Persons (Year 2000 Projected)
0 1/4 1/2 1 MILE

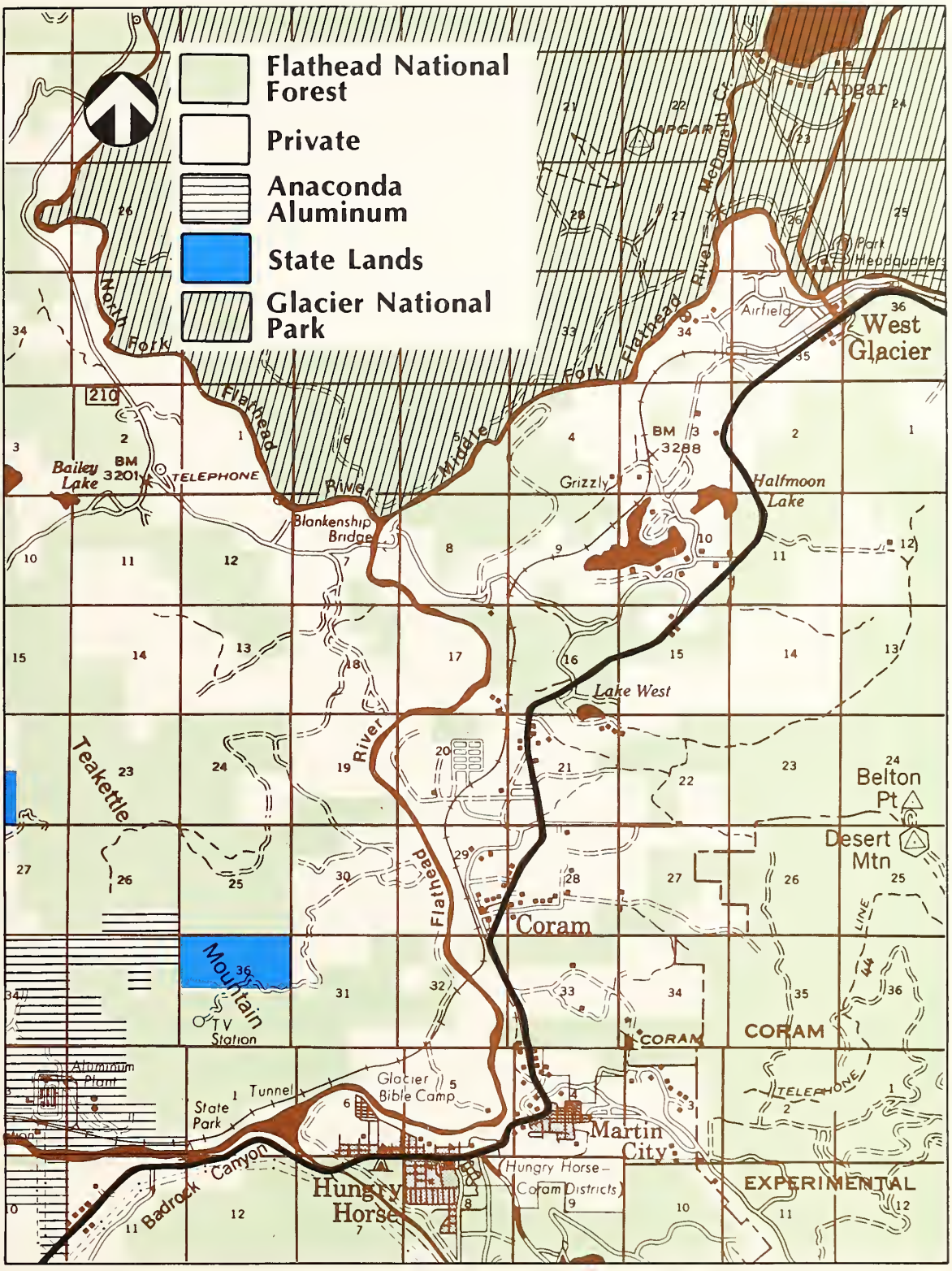


FIGURE 11–LAND OWNERSHIP

Although the communities in the canyon are small, simply structured towns, their relationship to the present, as well as to the future orientation of U.S. #2 is important. The existing pattern of development determines the course to be taken in planning for future improvements in the area, and can be used as an indication of the lifestyle and preferences of the local population. The importance of highway access to established commercial and public centers becomes readily apparent upon examination of land use data. Information shown on Figure No. 12 illustrates the distribution of several general land use types at the time of a land use survey taken in the spring of 1981.

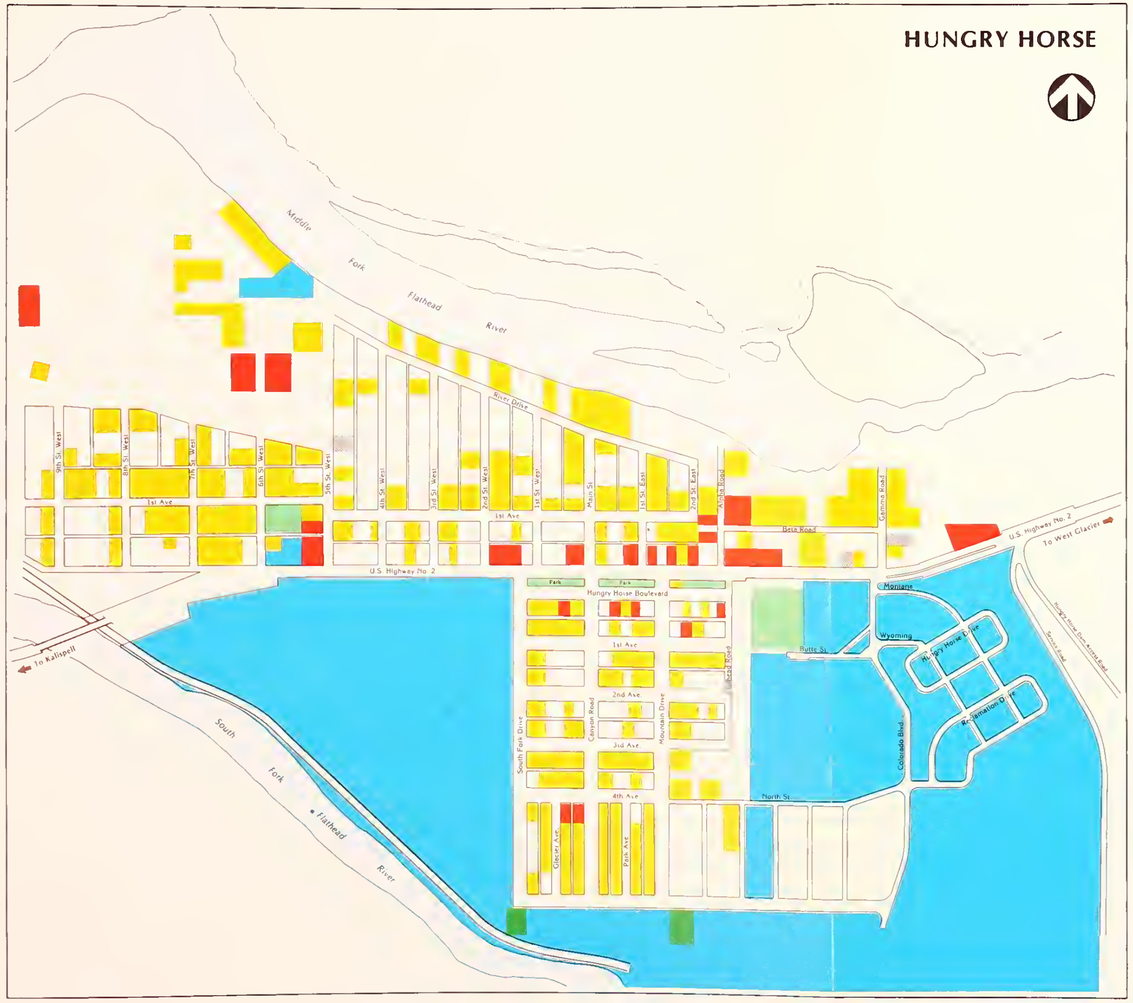
Generally speaking, each of the corridor towns has a small, linear commercial core, at least partially fronting on the existing alignment of U.S. #2. In Hungry Horse, the commercial area stretches along the entire length of the town. Most of the retail businesses are located on the north side of the highway and some privately operated camping and outdoor recreation facilities are situated near the junction of the Flathead River and South Fork of the Flathead River. In Martin City there are only three businesses in operation, and all of them are near the Central Avenue - U.S. #2 intersection. Both Coram and West Glacier have a fair amount of commercial activity which is located on the highway corridor. In West Glacier, however, approximately half of the retail establishments are located on F.A.P. 65 (the route to Glacier Park).

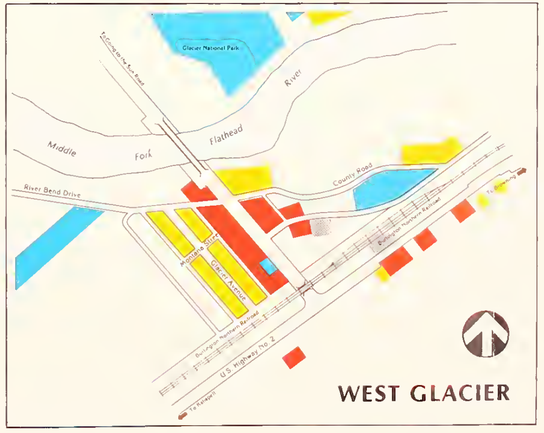
Residential use is by far the most land-intensive use in the study area communities, with the possible exception of the West Glacier townsite where commercial and residential uses are approximately equal. Hungry Horse, the largest community in the corridor, has a fairly evenly structured residential area. Housing districts are located on both sides of the highway and are buffered in most instances by commercial and public land parcels. This is also the case for residential development in Coram, where residences are clustered near the school land on the north side of the highway and Seville and Corbett Lane in the southern portion. Martin City exhibits a slightly different residential pattern in that Central Avenue rather than Highway #2 is the neighborhood dividing line. A relatively small amount of residential land is located across the highway from the major part of Martin City near the proposed highway alignment. The West Glacier residential community is small and well segregated from the highway corridor.

Public land in these communities is limited to those parcels which have been reserved for schools, parks, small public facilities such as fire departments, post offices and churches, and a large public parcel on the east end of Hungry Horse which is the local U.S. Forest Service Headquarters. The distribution of public and other lands in the study area is shown on Figure 12.

Land use planning for the corridor as well as the remainder of Flathead County is under the jurisdiction of the Flathead Regional Development Council. The local governing body is the Board of County Commissioners of Flathead County.

A land use plan for the county was adopted by Flathead County in March of 1978. This plan shows mostly residential development occurring near the communities. Due to public utility limitations, the residential densities for Coram, Martin City and West Glacier were recommended not to exceed two units per acre, while at Hungry Horse, densities up to





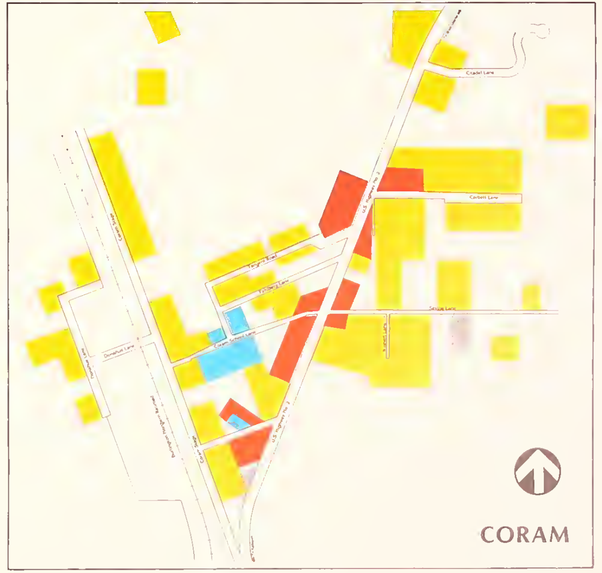


FIGURE 12– LAND USE

- Residential
- Commercial
- Public & Semi-Public
- Parkland
- Industrial
- Open Space

0′ 500′ 1000′

six to eight units per acre were permitted. The rural areas were categorized as agriculture/silviculture. The planning office recommends developments not to exceed a density of five acres per unit for this area.

Since 1973, there have been five minor subdivisions (five lots or less) and two major subdivisions (more than five lots) outside of the communities. These subdivisions have utilized slightly less than 200 acres. The Flathead Regional Development Office has observed and foresees only slight growth occurring in the corridor.[30]

4. COMMUNITY INFRASTRUCTURE & LIFESTYLE

In general, the community infrastructures in the corridor area are informal. None of these communities is incorporated. As a result, almost all services are either self-provided by the individuals or the communities in some type of informal arrangement, or provided by the county as is done for all rural areas in the county.

Medical facilities are not available in any of these communities other than first aid that could be administered by qualified residents. Law enforcement is provided by the county. Two sheriff's deputies reside in the area, one in Martin City and the other in Hungry Horse. In addition, the highway is patrolled by the Montana Highway Patrol, while the U.S. Park Rangers have jurisdiction in Glacier National Park.

Fire protection for the communities in this locality is provided by the volunteer fire departments. Hungry Horse has a fire district which is tax-supported. Martin City and Coram each have contribution-supported volunteer fire districts. West Glacier is currently provided fire protection by the National Park Service facilities.

This region of Flathead County is part of Columbia Falls School District No. 6, geographically the largest school district in Montana. It stretches from the Canadian border into the Bob Marshall Wilderness, including half of Glacier National Park and the northeast portion of the Flathead Valley. Area school children in grades seven to twelve are bused to Columbia Falls. Each of the four communities has its own elementary school for students in grades one to six. Since area residents can place their children in any one of these elementary schools, it is helpful to view the enrollment figures for the entire area. The totals of grades one through six for the past years have ranged from a high of 232 students to a low of 205 students. The low point was for the year 1980-81.[31]

The water systems of Hungry Horse, Martin City and Coram were built during the construction of Hungry Horse Dam. All three systems are now antiquated and, according to state officials, in need of significant renovation.[32] Minor improvements and repairs have been made simply to keep the systems running. Because of the outdated water systems in these communities, a surge in area population and housing would necessitate some major changes.

All houses in the area use septic tanks for the disposal of sanitary wastes. Hungry Horse has good drainage and no associated groundwater problems; however, Martin City, Coram and West Glacier have poor drainage which creates a perched water table. Consequently, septic tanks cannot be used everywhere, and according to a Flathead County

sanitarian, it is a touch-and-go situation.[33] If substantial growth occurs in Coram, Martin City or West Glacier, sewer lines and treatment facilities may be necessary to avoid groundwater contamination.

5. ECONOMY

a. Employment Characteristics

The primary employers important to residents of the Hungry Horse - West Glacier area are listed in Table No. 6. Columbia Falls is the site of a substantial portion of the lumber industry in the area and the single largest employer in Flathead County, Anaconda Aluminum, which currently employs 1,200 persons. The National Park Service is very important to persons in the West Glacier area, since a substantial number of Park employees live in the vicinity of West Glacier.

Each of these six large employers in the area projects their future employment to be stable. As a result, no large immigration of work force related to the current primary industries is anticipated. At the present time, discussions are being held concerning another reregulation dam that might be located just below the present Hungry Horse Reservoir Dam. If this government project were to proceed, significant employment for several years would certainly be attracted to this area.

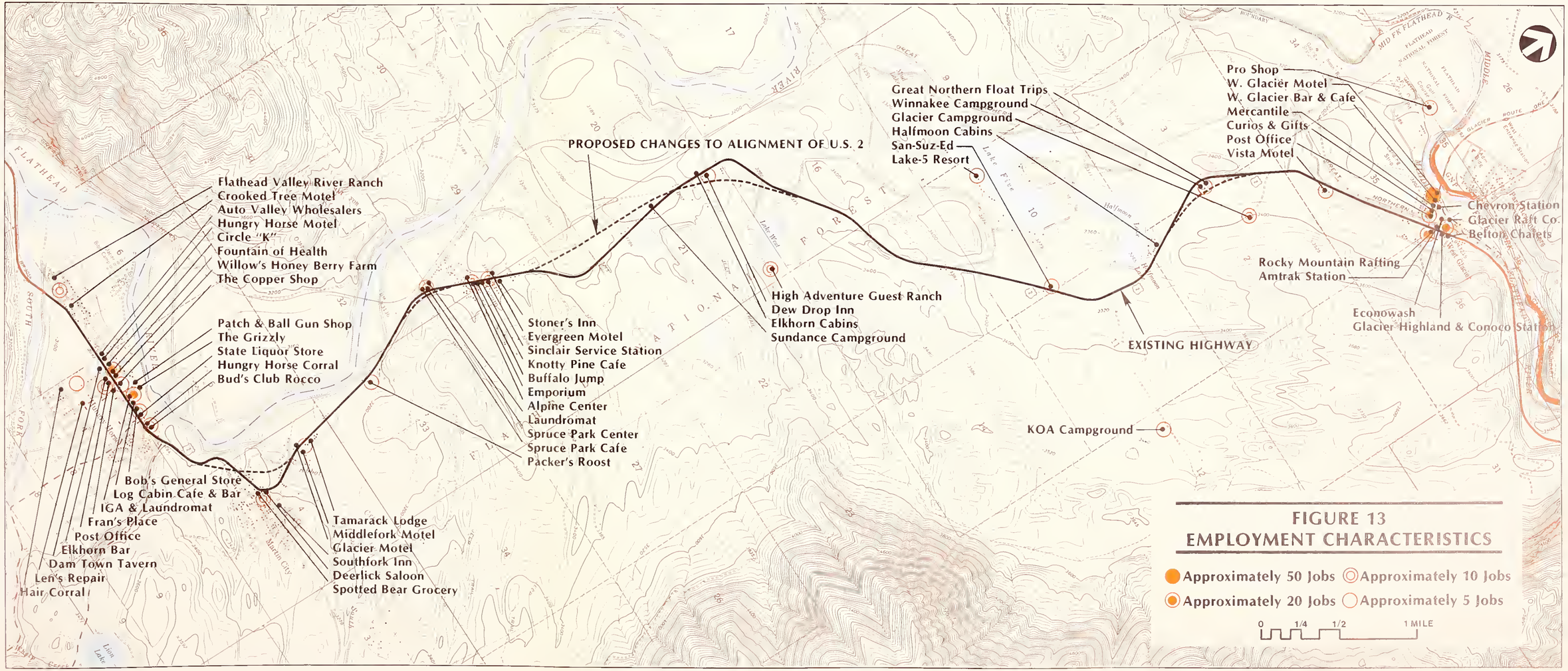
The employment by business in the corridor area between Hungry Horse and West Glacier is shown in Figure 13. Since the National Park Service at West Glacier, the Forest Service at Hungry Horse, and schools in the area are not considered as businesses, these places of employment are not shown on the figure. This information was obtained from personal interviews at the businesses along the project corridor.

TABLE NO. 6

MAJOR AREA EMPLOYERS

EMPLOYER	LOCATION	# OF EMPLOYEES	ESTIMATED # OF EMPLOYEES COMMUTING ON HIGHWAY 2	PROJECTED FUTURE EMPLOYMENT
Anaconda Aluminum	Columbia Falls	1,200	120	Stable
Plum Creek Lumber	Columbia Falls	650	10	Stable
Louisiana Pacific	Columbia Falls	100	--	Stable
Stoltze Lumber	Columbia Falls	95	5-10	Stable
Ntl. Park Service	Glacier Ntl. Park	90	27	Stable
U.S. Forest Service	Hungry Horse	20-70	Variable	Stable

Source: T.A.P. Telephone Interviews


PROPOSED CHANGES TO ALIGNMENT OF U.S. 2
EXISTING HIGHWAY
Flathead Valley River Ranch
Crooked Tree Motel
Auto Valley Wholesalers
Hungry Horse Motel
Circle "K"
Fountain of Health
Willow's Honey Berry Farm
The Copper Shop
Patch & Ball Gun Shop
The Grizzly
State Liquor Store
Hungry Horse Corral
Bud's Club Rocco
Bob's General Store
Log Cabin Cafe & Bar
IGA & Laundromat
Fran's Place
Post Office
Elkhorn Bar
Dam Town Tavern
Len's Repair
Hair Corral
Tamarack Lodge
Middlefork Motel
Glacier Motel
Southfork Inn
Deerlick Saloon
Spotted Bear Grocery
Stoner's Inn
Evergreen Motel
Sinclair Service Station
Knotty Pine Cafe
Buffalo Jump
Emporium
Alpine Center
Laundromat
Spruce Park Center
Spruce Park Cafe
Packer's Roost
High Adventure Guest Ranch
Dew Drop Inn
Elkhorn Cabins
Sundance Campground
Great Northern Float Trips
Winnakee Campground
Glacier Campground
Halfmoon Cabins
San-Suz-Ed
Lake-5 Resort
KOA Campground
Pro Shop
W. Glacier Motel
W. Glacier Bar & Cafe
Mercantile
Curios & Gifts
Post Office
Vista Motel
Chevron Station
Glacier Raft Co.
Belton Chalets
Rocky Mountain Rafting
Amtrak Station
Econowash
Glacier Highland & Conoco Station
FIGURE 13
EMPLOYMENT CHARACTERISTICS
Approximately 50 Jobs
Approximately 10 Jobs
Approximately 20 Jobs
Approximately 5 Jobs
0 1/4 1/2 1 MILE

Current total employment for these businesses is 311 employees. The distribution of these jobs is apparent from an examination of Figure 13.

b. Financial Characteristics

The financial characteristics of the area are typified by the breakdown of the average income per household. It is significant to note that almost one-third of the families in the county has a spendable income of less than $8,000.[34]

The total valuation of Flathead County, which is an important figure for determing growth in the county's economic base as well as the importance of raising funds through tax levies, has shown substantial growth in the last five years. From nearly 56 million dollars in 1975, the property valuation in the county has grown to over 81 million dollars in 1979.[35] This 43 percent rise over five years is among the highest in the state and provides a base for tax revenues to grow with economic development. In regard to the mill levies for Flathead County in fiscal year 1977 and fiscal year 1980, Flathead County government operations increased mill levies by 30 percent. All categories of county funds had a higher levy with the exception of the general fund and the debt levy.[36]

c. Overall Area Economic Base

The primary economic sectors generating employment in Flathead County have been described in earlier sections of this report. The manufacturing base for Flathead County is located seven miles west of the project area. The Anaconda Aluminum Plant, along with the lumber companies and area tourism, provides the primary economic base for people living in the corridor area. The businesses that exist in the corridor itself are primarily service-, tourism- and recreation-oriented.

In Flathead County, wholesale, retail and services trades are all growing at substantial rates, even taking into account the impacts of inflation. Trade volumes in the county have posted significant gains. In regard to future personal income, the categories of construction, manufacturing and the services should show increased income, whereas the relative rates of government, retail and wholesale trade, and agricultural products will likely slip in the percentage of total personal income.

6. TRANSPORTATION

Transportation facilities in the area of the project include the highway and local road network, air service, and rail service. The dominant means of transportation is the highway system, as it is throughout Montana.

In order to examine the transportation system's importance to the project, the transportation facilities in the surrounding area were also examined. These transportation facilities are shown in Figure 14.

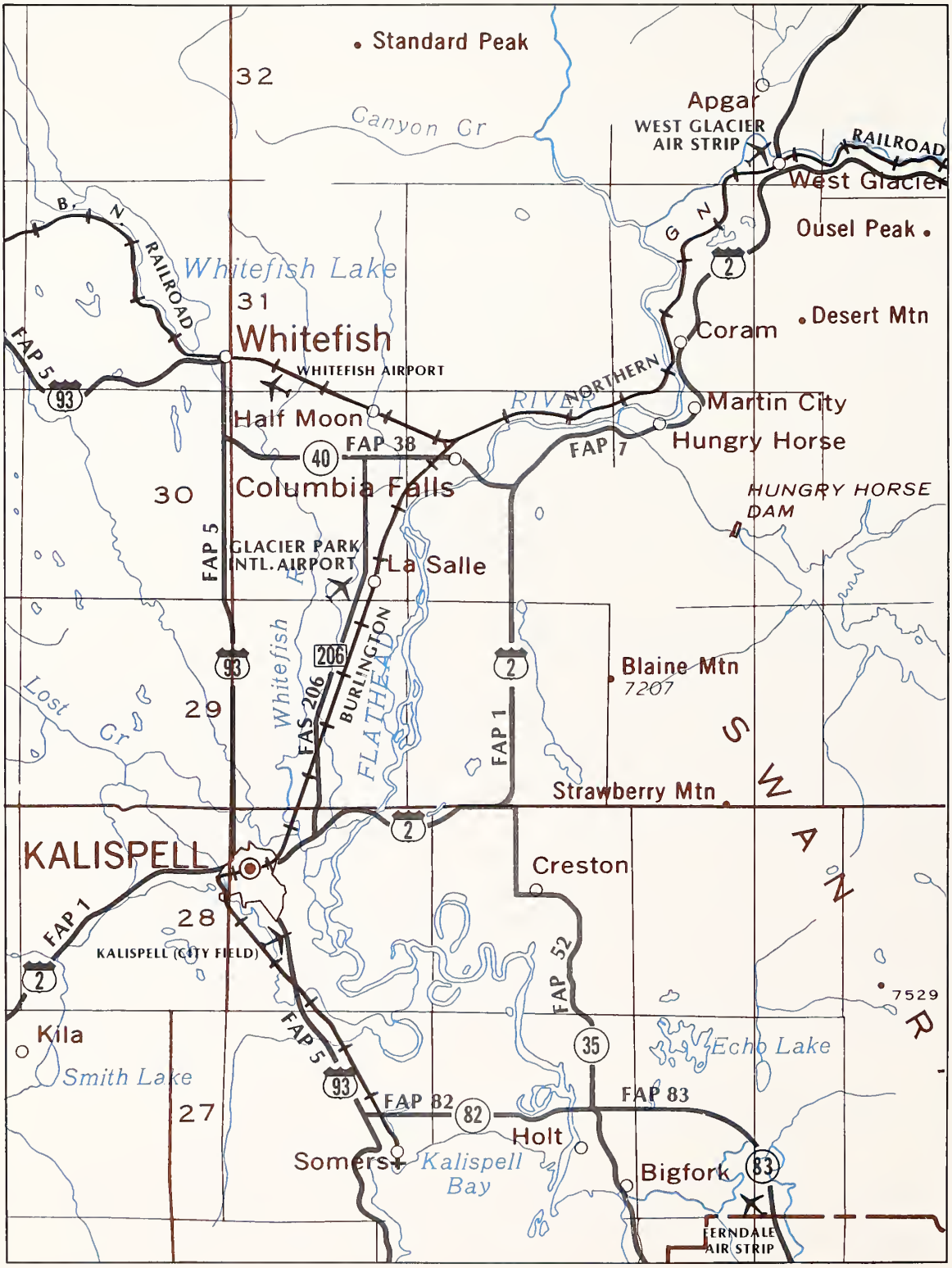


FIGURE 14 – TRANSPORTATION FACILITIES

a. Road System

The road system in the study area ranges from dirt roads serving local access needs to paved highways which serve as local and regional connecting links. U.S. #2 is the most important link of the highway system in this area, since it serves not only as a major route for local residents, but also as an east-west link for state and interstate automobile and truck traffic. The importance of the highway is reflected in its designation as one of two U.S. routes in the area. The other U.S. route is U.S. 93, which connects Whitefish with Kalispell southwest of the study area. These two highways intersect at Kalispell, providing the centroid for north-south and east-west traffic.

Except for the street systems in each of the canyon towns, only a limited amount of off-highway development has taken place. Local access loop roads have been constructed in the Lake Five and Halfmoon Lake areas. There are several other roads in the northern part of the corridor, including the Blankenship road which crosses the Flathead River near the confluence of the North Fork and Middle Fork and which connects FAS 486 with U.S. #2. Rough terrain has resulted in the location of county and Forest Service roads along the rivers in the southern part of the study area.

b. Air Service

The area which includes the corridor section of U.S. #2 is served by Glacier Park International Airport, which is the only air carrier airport in the area. The airport is located southwest of the study area approximately eight miles northeast of Kalispell. The other airports in the general vicinity are used for general aviation purposes and include Kalispell City Airport and small fields at Whitefish and Ferndale. All of these airports including Glacier Park International are publicly owned by the county and operated by the County Airport Authority with the exception of the Kalispell city airport, which is owned and operated by the city.

In addition to the airports previously mentioned, several small remote airstrips are located around the route. Four private airstrips are located on the North Fork of the Flathead River. The nearest of these to the study area is the MacFarland Airstrip, which was built in the 1940's and has since been acquired by the Park Service. Schafer Airstrip on the Middle Fork, Spotted Bear and Meadow Creek airstrips on the South Fork and a small airstrip near West Glacier are also in the general vicinity of the study area.These facilities are not well maintained and thus their use is quite limited.

c. Rail Service

As shown in Figure 14, there is a segment of the Montana rail network which passes through the study area running in a northeast-

southwest direction generally paralleling U.S. #2. The Belton terminal located at West Glacier is the only stop located in the corridor. The primary rail traffic terminal for the area is at Whitefish, a distance of 26 miles southwest of the Belton station.

While the rail system is primarily utilized for freight transport (22 to 25 trains per day), a limited amount of long-distance intercity rail passenger service is provided by the National Rail Passenger Corporation (AMTRAK). AMTRAK serves the Northern, or Hi-Line Burlington Northern Route with stops at several northern Montana communities. Trains operate daily May through September and during the Christmas holidays. For the remainder of the year, the train operates three times a week east and west.[37] The Montana Rail Plan shows AMTRAK on/off volumes for fiscal year 1978, providing a good illustration of the relative ridership densities on the route.[38] The data indicates that the Belton station had a comparatively small ridership volume for the year when considering all stations (a total of 2,288 on/off passengers), and that the Whitefish terminal was by far the busiest in the state (a total of 19,733 on/off passengers).

7. TRAFFIC

a. Traffic Counts

The Montana Department of Highways has a comprehensive traffic counting program that provides current and historical information on major highways throughout the state.[39] These counts consist of two types: 1) permanent traffic counters that provide a continuous traffic count record and information on traffic trends; and 2) surveillance counts taken at specified locations that provide information on traffic volumes. Currently, a total of 49 permanent traffic counters are located throughout the state. Since none of these counters is located on the existing highway being evaluated for this study, it was necessary to use a combination of several sources of information to estimate the current and project the future traffic conditions of the project corridor. The sources of data that were used include: 1) permanent counters with characteristics similar to those of the project corridor; 2) portable machine surveillance counts at locations within the corridor; and 3) manual turning movement counts conducted at key intersections located in the corridor.

b. Seasonal Variations in Traffic

Since there is no permanent recorder located within the project corridor to identify the seasonal fluctuation of traffic, data from permanent recorders that have current traffic conditions similar to those of the corridor were evaluated. A review of the permanent counter locations revealed that a combination of three traffic counters would best reflect the traffic characteristics of U.S. #2 from Hungry Horse to West Glacier. These locations are Permanent Counter No. A-19 on U.S. 287

just north of West Yellowstone, Counter No. A-36 on U.S. #2 southwest of Browning, and Counter No. A-39 on U.S. 89 north of Dupuyer. These counters were chosen because two (A-36 and A-39) are in the area of the proposed project and have historically been used to monitor traffic for U.S. #2 and Glacier Park[40], and the other (A-19) is representative of similar recreation-oriented traffic near a national park (Yellowstone).

Seasonal variations in traffic for 1980 were computed for each of these traffic counter locations, and then averaged to establish a representative seasonal variation that could be applied to the Hungry Horse - West Glacier highway corridor. Table No. 7 shows the seasonal variations as a percentage of the annual average daily traffic for each of the traffic counter locations, and the composite applicable to the Hungry Horse - West Glacier highway corridor. Figure 15 gives a graphic representation of the seasonal traffic variations of the composite of the three permanent counter locations for 1980.

TABLE NO. 7

SEASONAL VARIATIONS IN TRAFFIC
FOR PERMANENT COUNTERS[39]
(1980 Traffic)

	SEASONAL VARIATION IN TRAFFIC (% AADT)			
MONTH	STA A-19	STA A-36	STA A-39	COMPOSITE
January	44.34	51.41	44.95	46.90
February	55.25	69.22	49.14	57.87
March	54.67	78.51	54.74	62.64
April	60.52	96.86	38.56 *	65.31
May	86.32	109.29	115.86	103.82
June	147.13	121.88	149.23	139.41
July	209.37	162.36	193.76	188.48
August	209.29	151.49	201.17	187.32
September	130.66	113.08	131.25	125.00
October	88.96	100.93	91.69	93.86
November	58.60	83.88	75.51	72.66
December	54.89	61.04	54.14	56.69

* Counter malfunction

c. Annual Average Daily Traffic

In addition to the permanent traffic counters, surveillance counts are taken regularly at established count locations to provide data on traffic. These surveillance counts are typically taken with portable machine traffic counters for 24 hours per day for three days during the week. There are five locations along the Hungry Horse - West Glacier highway corridor that are periodically counted (generally at least once per year). In addition, two special traffic counts were taken in 1981.[40] Figure 16 shows the location of the portable machine count locations for this project.

The raw counts from the portable machine counts were adjusted by applying weekday and seasonal adjustment factors obtained from the three permanent counters considered representative of Hungry Horse - West Glacier traffic. Both 1979 and 1980 records were used to develop

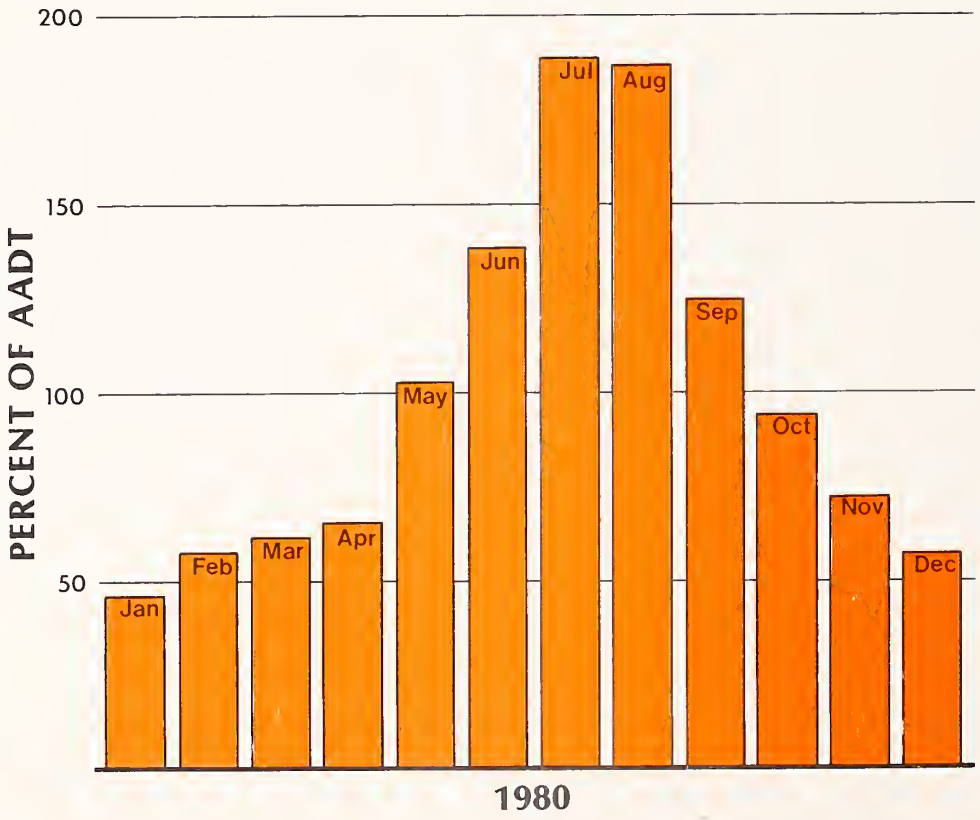
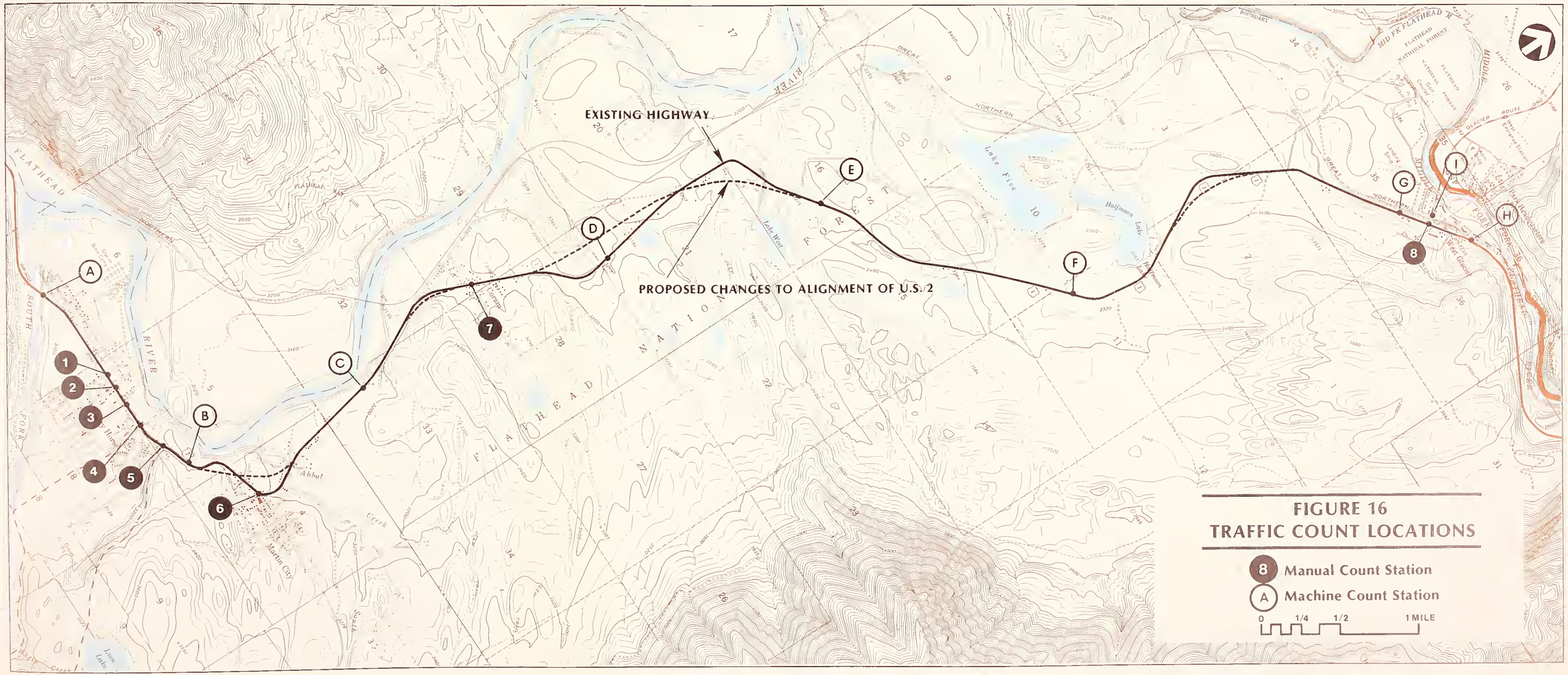


FIGURE 15 – SEASONAL TRAFFIC VARIATIONS


EXISTING HIGHWAY
PROPOSED CHANGES TO ALIGNMENT OF U.S. 2
A
B
C
D
E
F
G
H
I
1
2
3
4
5
6
7
8
FLATHEAD NATIONAL FOREST
FLATHEAD RIVER
SOUTH FORK
MIDDLE FORK
MID FK FLATHEAD R
NORTHERN
GREAT
Lake Five
Halfmoon Lake
Lake West
Martin City
Abbul
Camp
Creek
Lion Lake
GOING-TO-THE-SUN ROAD
WEST GLACIER
PARK HEADQUARTERS
FIGURE 16
TRAFFIC COUNT LOCATIONS
8 Manual Count Station
A Machine Count Station
0 1/4 1/2 1 MILE

these factors to compensate for the unique variations that might occur in a single year. These adjustment factors for the July counts that were taken are as follows:

	JULY 1979	JULY 1980	JULY COMPOSITE
Weekday Factor	1.0154	1.0205	1.0180
Seasonal Factor	.5497	.5305	.5401
Combined Factor	.5582	.5414	.550

By using this composite seasonal adjustment factor, the estimated 1981 annual average daily traffic counts were determined. Table No. 8 shows the counts that were taken in early and late July and the estimated 1981 annual average daily traffic for each count location.

TABLE NO. 8

1981 ANNUAL AVERAGE DAILY TRAFFIC

COUNT LOCATION	EARLY JULY COUNT	LATE JULY COUNT	AVG. JULY WEEKDAY COUNT	ANNUAL SEASONAL ADJUST. FACTOR*	AVERAGE DAILY TRAFFIC
A	6,789	6,958	6,874	.55	3,780
B	6,021	6,376 **	6,198	.55	3,409
C	5,383	5,883	5,633	.55	3,098
D	5,027	5,147	5,086	.55	2,797
E	4,436	4,950	4,693	.55	2,581
F	4,603	4,993	4,798	.55	2,639
G	4,787	5,159	4,973	.55	2,735

* Using composite of three permanent counters

** Counter malfunctioned - traffic volume estimated

To provide as much consistency as possible in comparing historical traffic volumes, this method of adjusting traffic counts was applied to as many counts that were taken in this corridor during the past years for which records were still available. These include 1977, 1978, 1979, and 1980 counts. Adjustment factors for the same years that the counts were taken were applied to the machine counts to obtain annual average daily traffic volumes. For years other than those listed, annual average daily traffic volumes as contained in the Department of Highways records were used.

Table No. 9 shows the historical annual average daily traffic volumes for the portable traffic counter station between Hungry Horse and Martin City (Station B). This location was chosen to illustrate historical traffic volumes because it has the longest continuous record of traffic counts along the project corridor.

TABLE NO. 9

ANNUAL AVERAGE DAILY TRAFFIC (AADT)
BETWEEN HUNGRY HORSE & MARTIN CITY

YEAR	AADT	YEAR	AADT	YEAR	AADT
1937	370	1952	1,550	1967	2,467
1938	414	1953	1,585	1968	2,965
1939	458	1954	1,750	1969	2,924
1940	442	1955	1,915	1970	3,006
1941	480	1956	1,748	1971	2,572
1942	380	1957	1,909	1972	2,655
1943	280	1958	2,055	1973	2,783
1944	310	1959	2,150	1974	2,752
1945	340	1960	2,190	1975	3,235
1946	509	1961	2,130	1976	3,634
1947	605	1962	2,145	1977	4,126 *
1948	1,050	1963	2,035	1978	3,775 *
1949	1,350	1964	2,060	1979	4,075 *
1950	1,450	1965	2,160	1980	3,505 *
1951	1,460	1966	2,150	1981	3,409 *

* AADT computed from machine count adjusted by average of factors from permanent counter locations A-19, A-36, and A-39. Other AADT's from Department of Highways records.

d. Projected Annual Average Daily Traffic

From the records of annual average daily traffic volumes between Hungry Horse and Martin City, the historical traffic growth can be plotted and shown in graphic form. The past trends can also be examined to establish estimates for future traffic volumes. Figure 17 shows the estimated AADT for each year from 1937 to 1981 and the projected traffic to the year 2003, which is the established design year for the project. (Projects of this nature are typically designed for twenty years from the date the highway will be put into service.)

As can be noted from the graph, traffic has increased in an erratic fashion since traffic records have been kept. This period includes major disruptions including World War II, a recession and energy shortages in the early and mid-70's, and sharply increasing fuel prices from

the late 70's to the present. Through all of these social changes, the traffic growth can best be illustrated by a band of approximately 700 vehicles growing at the rate of about 80 vehicles per year, with very few exceptions (see Figure 17).

This growth band has been established through a period spanning 45 years. While it is impossible to say with certainty what future traffic will be due to the probability of less fuel available and higher prices, the best estimate that can be made based on current knowledge and established trends is that this moderate growth will likely continue through the design year. This is particularly true when it is noted that high-mileage vehicles now being produced substantially lessen the impact of increasing fuel prices and decreasing quantities.[41]

On the basis of this logic and the established historical trend, it is estimated that the design year (2003) annual average daily traffic will

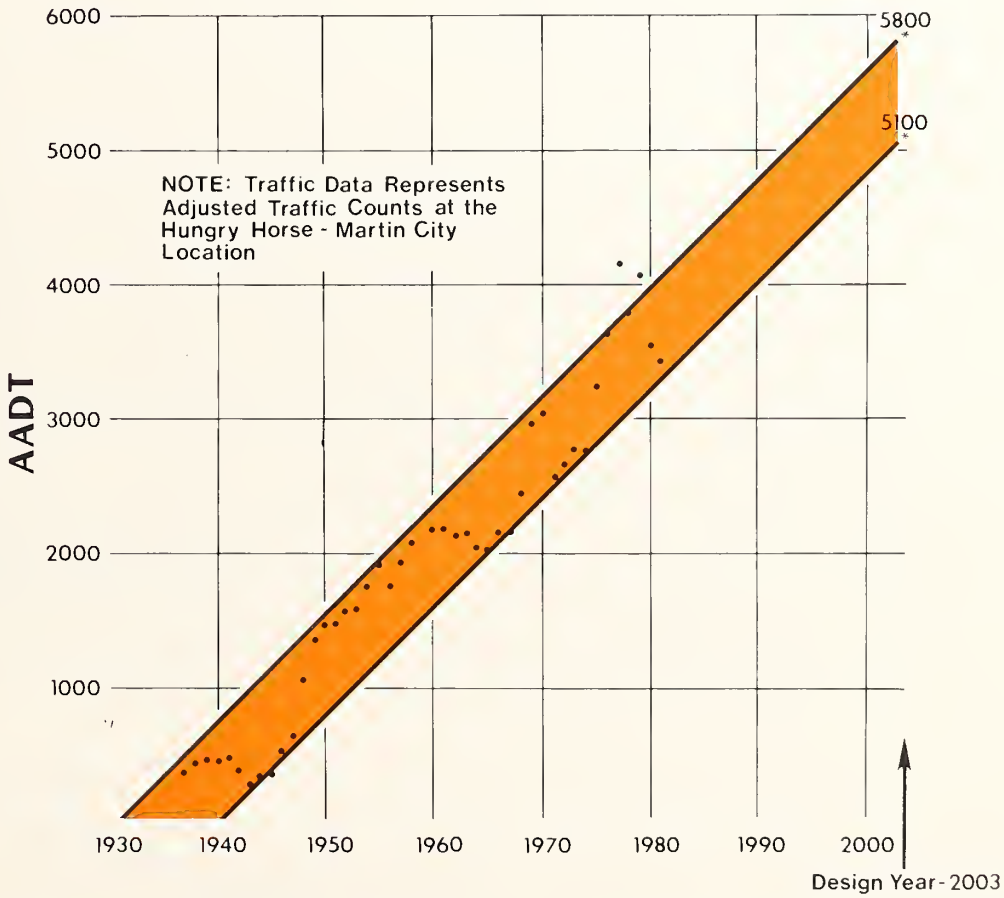


FIGURE 17 – HISTORICAL TRAFFIC GROWTH & PROJECTIONS

be from 5,100 to 5,800 vehicles per day between Hungry Horse and Martin City as illustrated in Figure 17.

This range represents an increase of from 50 to 70 percent for a 22-year period. The Office of Technology Assessment, U.S. Congress estimates a national increase in travel of 70 percent for the 25-year period from 1975 to the year 2000 for principal arterials.[42] A publication prepared for the Federal Highway Administration by System Design Concepts, Inc. of Washington D.C. indicates a national increase in travel of about 60 percent from 1980 to 2000 for the most likely forecast.[43]

It is expected that the traffic on the Hungry Horse - West Glacier highway would grow at a rate at least comparable to national traffic increases. In view of the national figures, the traffic growth estimates for the Hungry Horse - West Glacier project appear to be reasonable.

e. Design Hourly Volumes

Highways are typically designed for traffic volumes that should not be exceeded very often. The standard that is normally used is the 30th highest hourly volume of the year for which the highway is designed.[44] In the case of this project, the composite hourly volume variation for the three permanent counter locations A-19, A-36, and A-39 were used to establish a graph showing the highest hourly volumes of the year as a percentage of the annual average daily traffic. This graph (which is considered representative of conditions occurring on the Hungry Horse - West Glacier project) and other curves showing the hourly volume characteristics for other types of highways are shown in Figure 18.[45]

As can be noted from this figure, the characteristics of the curve plotted for the composite of the three permanent counters fall between the curves that are characteristic of a partially recreational route and a main rural route. This is consistent with the function of the Hungry Horse - West Glacier highway, which carries recreational travel and is an important main highway route.

By examining the graph it can also be noted that the 30th highest hourly volume is appropriate for the selection of a design hourly volume. The design hourly volume for this project based on the results of this figure is 18.7 percent of the AADT. To confirm the selection of this design hourly volume (K) Factor, the 30th highest hourly volume for existing AADT's was computed and compared with the maximum volume observed. This information is contained in Table No. 10, which follows.

This table reflects that the maximum hourly volumes actually observed during the July counts exceeded the calculated present 30th highest hourly volumes. At most count stations, several traffic counts were observed that exceeded the calculated design hourly volumes. This evidence provides confirmation of the reasonableness of the design hourly factor chosen for the Hungry Horse - West Glacier project.

On the basis of the design hourly volume factor chosen, the estimated future design hourly volumes were calculated. Because of the uncertainty of future events, maximum and minimum future design hourly volumes have been calculated rather than a single estimate. These design hourly volumes are shown in Table No. 11.

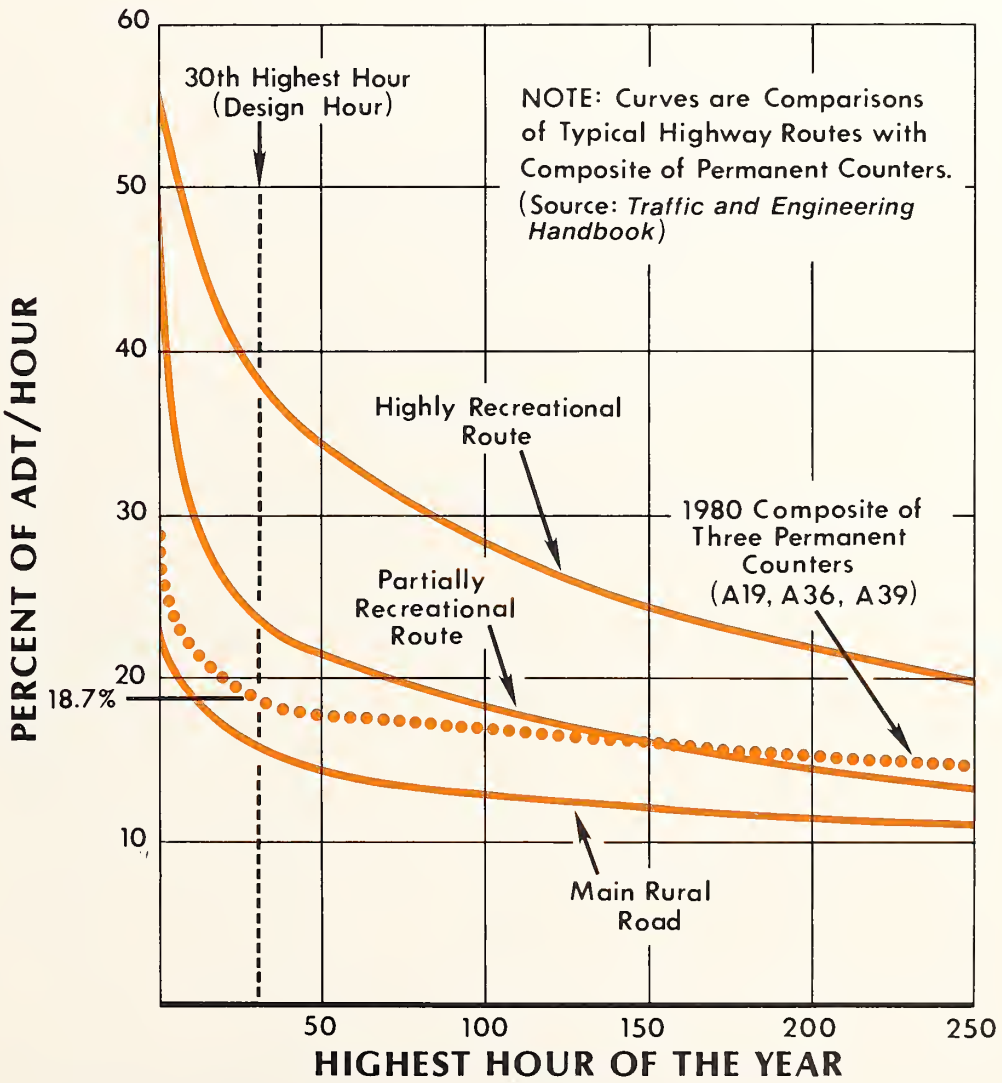


FIGURE 18 – HIGHEST HOURLY VOLUMES

TABLE NO. 10

PRESENT 30th HIGHEST HOURLY VOLUMES
(1981)

COUNT LOCATION	AADT	30th HIGHEST HR. VOLUME FACTOR*	PRESENT 30th HIGHEST HR. VOLUME	MAX. HR. VOLUME OBSERVED
A	3,780	.187	707	716
B	3,409	.187	637	671
C	3,098	.187	579	602
D	3,797	.187	523	601
E	2,681	.187	483	578
F	2,639	.187	493	581
G	2,735	.187	511	598

* Taken from the average of 1980 30th highest hourly volume factors for Stations A-19, A-36, and A-39. (See graph plotting percentages of AADT versus highest hourly volume rankings).

TABLE NO. 11

DETERMINATION OF FUTURE
DESIGN HOURLY VOLUMES

COUNT	AVERAGE ANNUAL DAILY VOLUMES		DESIGN HOURLY VOLUMES*	
LOCATION	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
A	5,650	6,420	1,060	1,200
B	5,100	5,800	950	1,080
C	4,640	5,280	870	990
D	4,250	4,830	790	900
E	3,870	4,400	720	820
F	3,960	4,500	740	840
G	4,170	4,740	780	890

* Design hourly volume is determined by multiplying the Average Annual Daily Volume by a "K" factor of .187. The design year is 2003.

f. Pedestrians & Bicyclists

1) COUNT LOCATIONS

Traffic monitoring stations were located at key intersections in each of the communities for seven-hour count periods during May and July of 1981. In addition to vehicular traffic volumes (including turning movements), pedestrian and bicyclist activities were observed at these locations. Figure 16 shows the count locations for data recorded along the project corridor. Five locations in Hungry Horse and one each in Martin City, Coram and West Glacier were selected for the manual count observations.

2) GENERAL PEDESTRIAN-BIKER OBSERVATIONS

Use of the highway by pedestrians and bikers can be described by an analysis of the pedestrian and bicyclist traffic crossing the highway as opposed to traveling along the highway. The surveys taken show that most of the pedestrians and bicyclists cross the highway. Out of a total of 880 pedestrians and bikers counted, 626 were observed crossing the highway and 254 were observed traveling along the highway.

Crossing volumes were highest at the Coram station, which had 119 crossings during the seven-hour count period in July. West Glacier had nearly that many crossings during both the May and July inventory periods. All stations except Main Street in Hungry Horse (Hungry Horse #1) had relatively low counts along U.S. Highway #2.

Pedestrian and bicyclist counts are shown in Figures 19 and 20. In order to evaluate the effect of schools on pedestrians and bikers, the counts were conducted both in May during the school year and in July when school was not in session.

Generally speaking, pedestrian figures for May were slightly higher than the July count totals. Volumes in Coram were notably higher in May while West Glacier pedestrian - biker use remained relatively constant for both periods. In Hungry Horse, the data comparison for Intersection #1 revealed a slight increase in activity from May to July. It is important to note that although the July total is higher, more crossings occurred during the May observations. The numbers recorded at Martin City showed a consistently low level of activity during both inventory periods for highway crossings as well as through traffic.

Several factors have a direct bearing on volumes at locations in Hungry Horse, Coram, and West Glacier. Two of the count locations in Hungry Horse are located adjacent to retail establishments which draw a considerable business volume in the course of a normal day. Hungry Horse #1 and Hungry Horse #3 are situated near a Circle K and an IGA store, respectively. Both of these businesses attracted walk-in and bicycle traffic, especially during the school term. Similar situations exist in Coram and West Glacier, where the highest pedestrian and biker volumes occurred. A store in Coram located at the intersection of Coram School Lane and U.S. #2 (where the count was taken) was observed to be one of the busiest spots in the corridor and attracted a high number

of pedestrians during both count periods. Bicycle traffic dropped off significantly at this location after the school term ended. Heavy concentrations of pedestrian traffic in West Glacier are directly related to employee crossings from the Burlington Northern depot to a local cafe directly across the highway. These crossings were fairly consistent during the two count periods.

Pedestrian and bicyclist volumes at the Martin City count station are low. This information represents activity on the highway, but does not reflect pedestrian and bicycle movements across Central Avenue where it intersects with U.S. #2. High crossing volumes were recorded on this street during the May inventory period.

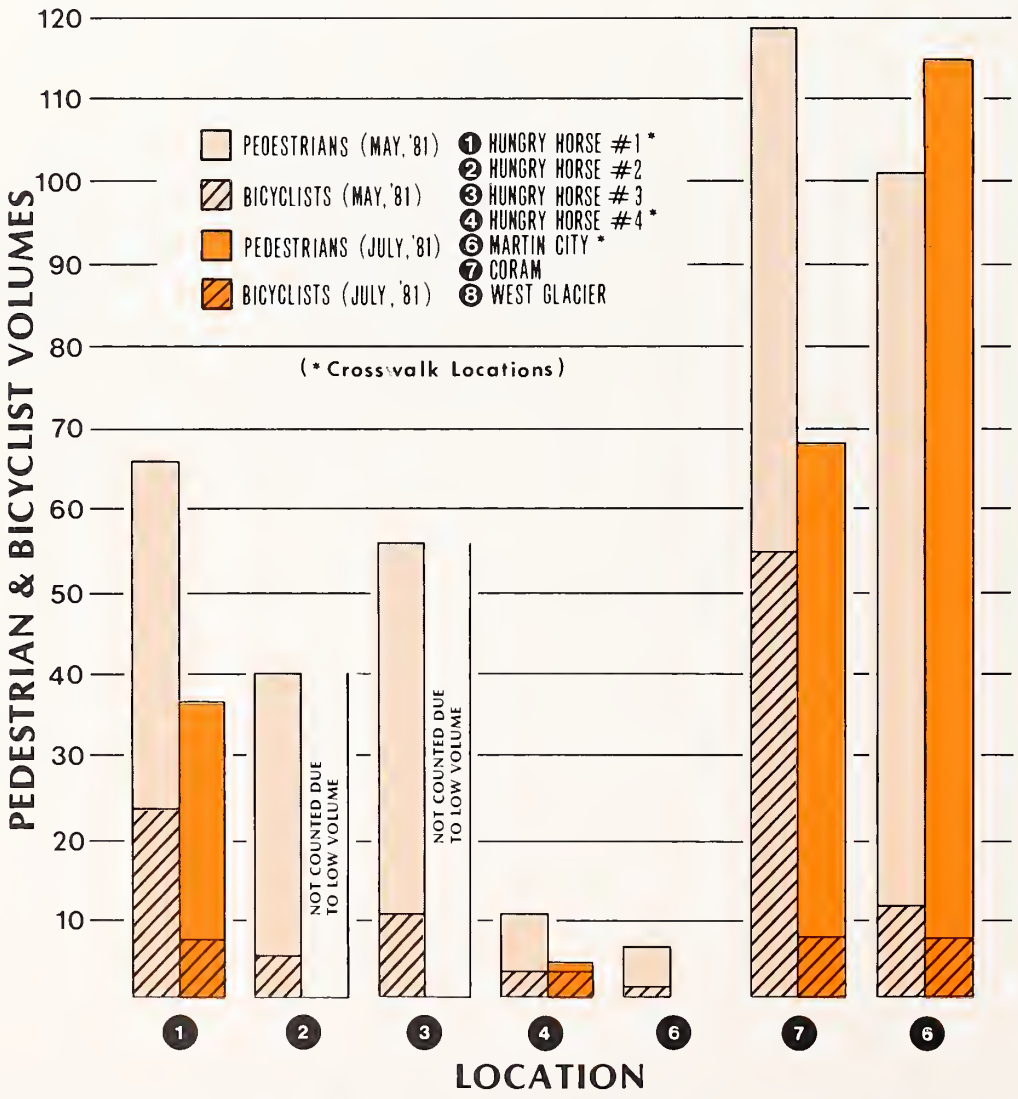


FIGURE 19–PEDESTRIAN & BICYCLIST ANALYSIS (CROSSING TRAFFIC)

Another factor which is an important consideration in the interaction of pedestrian and vehicular traffic is the location of designated crosswalks. Four crosswalks are marked for this purpose. Hungry Horse #1 (at the Main Street intersection) and Hungry Horse #4 (at the Colorado Boulevard intersection) are crosswalks that serve the west and east ends of the town and are intended to provide crossings for elementary school children. Significant use of the Main Street facility during the school term was observed, but relatively little activity occurred at the Colorado Boulevard crossing. Another crosswalk facility is situated at the east end of Martin City, where only one pedestrian crossed during the seven-hour count periods. The remaining crosswalk is located in Coram, where a number of pedestrians were observed using the crosswalk in both May and July. However, bikers used this crossing in May but not in July, indicating that many school children ride their bikes to the Coram School.

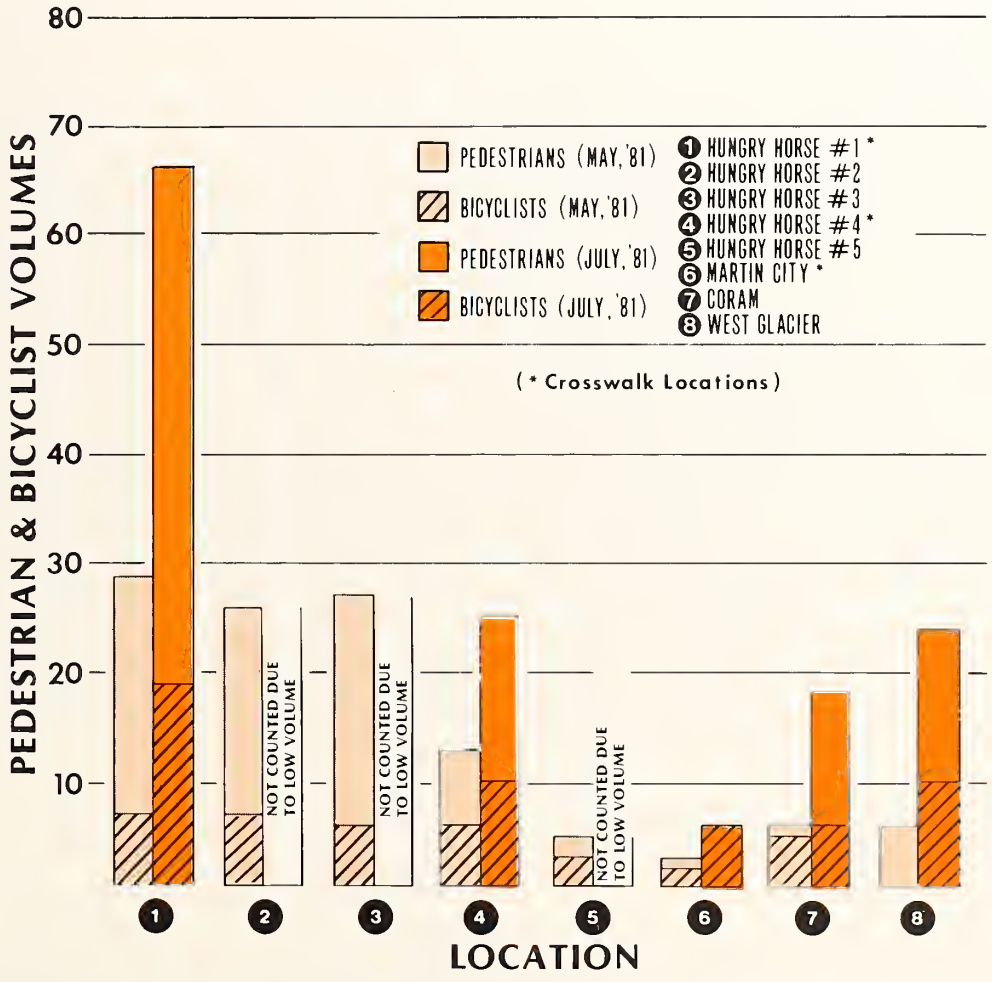


FIGURE 20–PEDESTRAIN & BICYCLIST ANALYSIS (THROUGH TRAFFIC)

8. TRAFFIC SAFETY

a. Existing Highway

The existing highway between Hungry Horse and West Glacier is characterized by several physical features that create hazardous traffic situations. These features include a number of curves and grades along this corridor that do not meet current design standards adopted by the Montana Department of Highways.[46] In addition to these characteristics, there are a number of accesses that create a hazardous situation, particularly on this narrow roadway with limited sight distance. There are very few existing facilities for pedestrians and bicyclists, with virtually no sidewalks and only four painted school crossings along this section of highway.

b. Traffic Accidents

A detailed investigation of accidents occurring on the Hungry Horse - West Glacier highway was conducted to establish current accident numbers, rates, and types. The Montana Department of Highways maintains accident records for each highway in the Montana Highway Information System program. Records for a five-year period (1976 to 1980) were obtained, tabulated, and plotted to determine high accident locations. Accident records for this section of highway were also inspected at the Montana Department of Highways office in Kalispell for 1979, 1980, and through May of 1981. Figure 21 shows the locations of the accidents occurring along the corridor by type of accident for the five-year period 1976 through 1980.

An inspection of the accident locations revealed that the highway can be divided into three distinct sections with varying accident rates. These sections are: 1) from the South Fork Bridge west of Hungry Horse to Abbot Creek northeast of Martin City; 2) from Abbot Creek to east of Coram; and 3) from east of Coram to West Glacier.

The accidents that occurred on the highway and the accident rate by section are tabulated in Table No. 12.

For comparison, the average accident rates for different types of rural highways in Montana for the period from 1977 through 1980 are as follows:[47]

Interstate	1.35 acc./mvm
Primary	2.43 acc./mvm
Secondary	2.92 acc./mvm

A comparison of the statewide averages with the accidents occurring along the corridor shows that the section of highway from the South Fork Bridge to Abbot Creek (accident rate of 5.578 acc./mvm) and the section of highway from Abbot Creek to east of Coram (accident

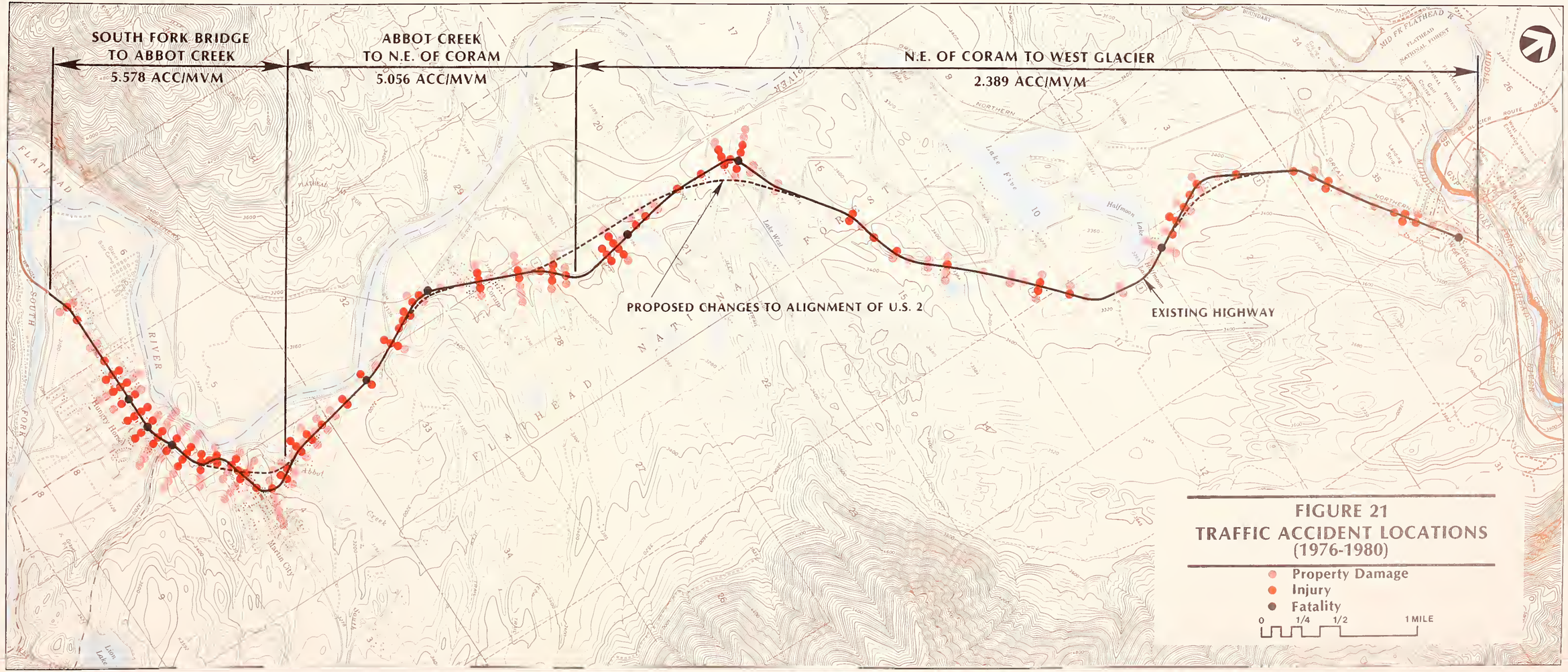

SOUTH FORK BRIDGE TO ABBOT CREEK
5.578 ACC/MVM
ABBOT CREEK TO N.E. OF CORAM
5.056 ACC/MVM
N.E. OF CORAM TO WEST GLACIER
2.389 ACC/MVM
PROPOSED CHANGES TO ALIGNMENT OF U.S. 2
EXISTING HIGHWAY
FIGURE 21
TRAFFIC ACCIDENT LOCATIONS
(1976-1980)
Property Damage
Injury
Fatality
0 1/4 1/2 1 MILE

TABLE NO. 12

ACCIDENT RATE SUMMARY

ACCIDENT TYPE	5-YEAR TOTAL ACC.	ACC. PER YR.	ACC. PER MI/YR	ACC. (MVM)
South Fork Bridge to Abbot Creek (2.315 mi.)				
Property Damage	48	9.6	4.14	2.818
Injury	44	8.8	3.80	2.584
Fatality	3	0.6	0.26	0.176
Total	95	19.0	8.20	5.578
Abbot Creek to East of Coram (2.032 mi.)				
Property Damage	31	6.2	3.05	2.528
Injury	29	5.8	2.85	2.365
Fatality	2	0.4	0.20	0.163
Total	62	12.4	6.10	5.056
East of Coram to West Glacier (7.020 mi.)				
Property Damage	52	10.4	1.48	1.308
Injury	39	7.8	1.11	0.981
Fatality	4	0.8	0.11	0.100
Total	95	19	2.70	2.389
Total Highway Section (11.367 mi.)				
Property Damage	131	26.2	2.30	1.897
Injury	112	22.4	1.98	1.622
Fatality	9	1.8	0.16	0.130
Total	252	50.4	4.44	3.649

4.5 acc/mvm or greater indicates a critical area that should be investigated further.

* Accidents per million vehicle miles. Average traffic for the five-year period and the lengths of each section were used to calculate million vehicle miles of travel.

rate of 5.056 acc./mvm) are substantially greater than the average accident rate of 2.40 acc./mvm for all rural primary highways in Montana. The section of highway from east of Coram to West Glacier (2.389 acc./mvm) is very close to the statewide average.

The Montana Department of Highways considers an accident rate of 4.5 accidents per million vehicle miles or greater as a critical section of highway which should be investigated in detail for probable improvement.[47] On the basis of this criteria, the sections of highway from the South Fork Bridge to east of Coram are in need of safety improvements.

The specific types of accidents that are occurring along this section of roadway are shown in Table No. 13. Accident rates for each section are shown in Figure 22.

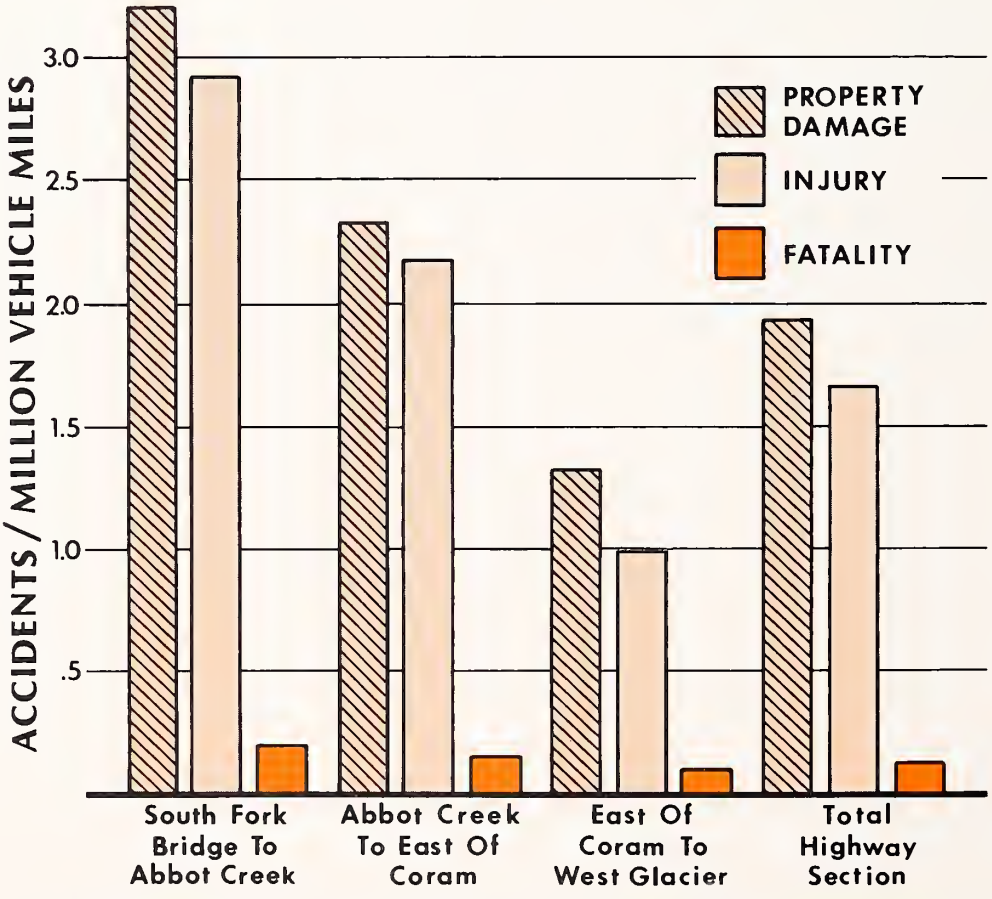


FIGURE 22 – ACCIDENT RATES (1976-1980)

c. Pedestrian and Bicyclist Accidents

As shown in Table No. 13, it can be noted that several pedestrian accidents have occurred along the corridor during the last five years. From the South Fork Bridge to Abbot Creek there were one pedestrian-related accident and two bicycle-related accidents. From Abbot Creek to east of Coram there were five pedestrian-related accidents, and from east of Coram to West Glacier there were one pedestrian-related accident and one bicycle-related accident. Details of the pedestrian- or bicycle-related accidents recorded for the entire section from 1976 through 1980 are summarized in Table No. 14.

Examination of the accident data indicates that three of the seven pedestrian-related accidents during the last five years resulted in fatalities. Fatal accidents occurred within the business districts of Hungry Horse and West Glacier. In both cases, pedestrians were attempting to cross the highway when they were struck by vehicles. The only other pedestrian fatality in the section during the last five years occurred in an accident south of Coram when a vehicle struck a pedestrian walking with traffic late at night.

Circumstances regarding the causes of individual pedestrian and bicycle-related accidents which occurred between Hungry Horse and West Glacier were for the most part unrelated. However, two similarities are evident from an examination of the accident records. The majority of the pedestrian and bicycle accidents involved young people or the elderly. Young people were involved in two of the seven pedestrian accidents and two of the three bicycle accidents. In addition, most of the pedestrian- and bicycle-related accidents occurred at night. Five pedestrian accidents and two bicycle accidents occurred during the late evening or night.

d. South Fork Bridge

The South Fork Bridge, which spans the South Fork of the Flathead River just west of Hungry Horse, is known to area residents and the Department of Highways as a high accident location.[47] The South Fork Bridge was one of the state's problem areas for high incidence of nighttime accidents.[47] Accident studies conducted by the Department of Highways indicate that 22 accidents occurred on or near the South Fork Bridge between January 1, 1972 and December 31, 1980. The locations and types of accidents that occurred over the period are shown in Figure 23.

South Fork Bridge accidents have several characteristics that should be noted. The characteristics of the 22 recorded accidents occurring during this period are:

* 21 of the 22 recorded accidents for this section were single-car accidents
* 17 of the accidents occurred at night
* 15 of the accidents occurred during wet, icy, or snowy conditions

TABLE NO. 13

ACCIDENT DETAILS SUMMARY
(1976 - 1980)

CIRCUMSTANCES		S. FORK BRIDGE TO ABBOT CREEK (2.315 mi.)	ABBOT CREEK TO E. OF CORAM (2.032 mi.)	E. OF CORAM TO WEST GLACIER (7.020 mi.)	TOTAL (11.367 mi.)
Total Accidents Per Section		95	62	95	252
Light	Day	43	30	46	119
	Night	52	32	49	133
Weather/Road*	Clr/Dry	59	38	63	160
	Clr/Wet	17	12	14	43
	Cldy/Wet	19	12	18	49
Single-Car Accidents		56	41	63	160
Collision Type (2 vehicles)	Rear End	10	7	13	30
	Head On	8	1	6	15
	Angle	16	9	4	29
	Side/Pass	2	1	6	9
	Side/Meet	3	4	3	9
Contrib. Factors **	Road Cond.	6	5	5	16
	Drink	16	8	37	82
	Speed	30	15	37	82
	Other	49	39	43	131
Ped. Related		1***	5***	1***	7
Bicycle Related		2	-	1	3
Animal Related		1	1	-	4

* "Wet" includes rainy, snowy and icy conditions.
** "Other" includes improper pass, failure to signal, improper turn, failure to yield right-of-way.
*** Includes one fatal accident.

TABLE NO. 14

PEDESTRIAN/BICYCLE ACCIDENTS
1976 THROUGH 1980

LOCATION	DATE	TIME	AGE OF PED. OR BIKER	ACCIDENT DESCRIPTION
Hungry Horse	6/2079	4:30 p.m.	Biker-12 yrs.	Biker ran into side of car
Hungry Horse	10/19/77	11:50 p.m.	Biker-12 yrs.	Biker in roadway, driver swerved to avoid hitting biker head-on
Hungry Horse*	7/2/77	3:20 a.m.	Ped.-47 yrs.	Ped. darted in path of vehicle
Near Abbot Creek Bridge	12/23/77	9:40 a.m.	Ped.-79 yrs.	Ped. walking with traffic caused collision when Vehicle #1 slowed, Vehicle #2 struck Vehicle #1
Between Martin City & Coram	7/24/79	10:45 a.m.	Ped.-13 yrs.	Ped. in roadway had arm struck by vehicle
Curve south of Coram	3/27/76	9:00 p.m.	2 Ped.-11 yrs.	Peds. getting out of parked car when second parked car struck from rear and forced into first parked car
Curve south of Coram*	7/24/78	12:00 p.m.	Ped.-30 yrs.	Ped. walking with traffic when struck by vehicle
Coram	7/01/78	2:15 a.m.	Ped.-28 yrs.	Ped. in roadway struck by mirror of vehicle
North of Coram	7/18/78	11:30 p.m.	Biker-26 yrs.	Car hit biker from rear
West Glacier*	8/31/77	9:45 p.m.	Ped.-74 yrs.	Ped. hit while crossing from cafe to depot

* Fatal Accident

* 16 of the recorded accidents occurred during November and December
* The majority of the accidents occurred on the structure or on the west approach to the bridge. Only two accidents occurred on the east approach.
* Nearly all of the accidents involved loss of control, skid, or a spin, and may be attributed to icy road conditions or excess speed.
* Most accidents occurred within the lane of travel. Only five of the accidents involved vehicles that crossed lanes.

As can be noted from the accident diagram in Figure 23, traffic from Hungry Horse onto the bridge does not appear to be a problem.

In an effort to reduce the number of accidents that occur on the South Fork Bridge, the Department of Highways recently designated the area as a pilot project to test the effectiveness of special signing in accident prevention. Since the signs were installed, accidents in the bridge area have been reduced by an estimated 30 percent.[47]

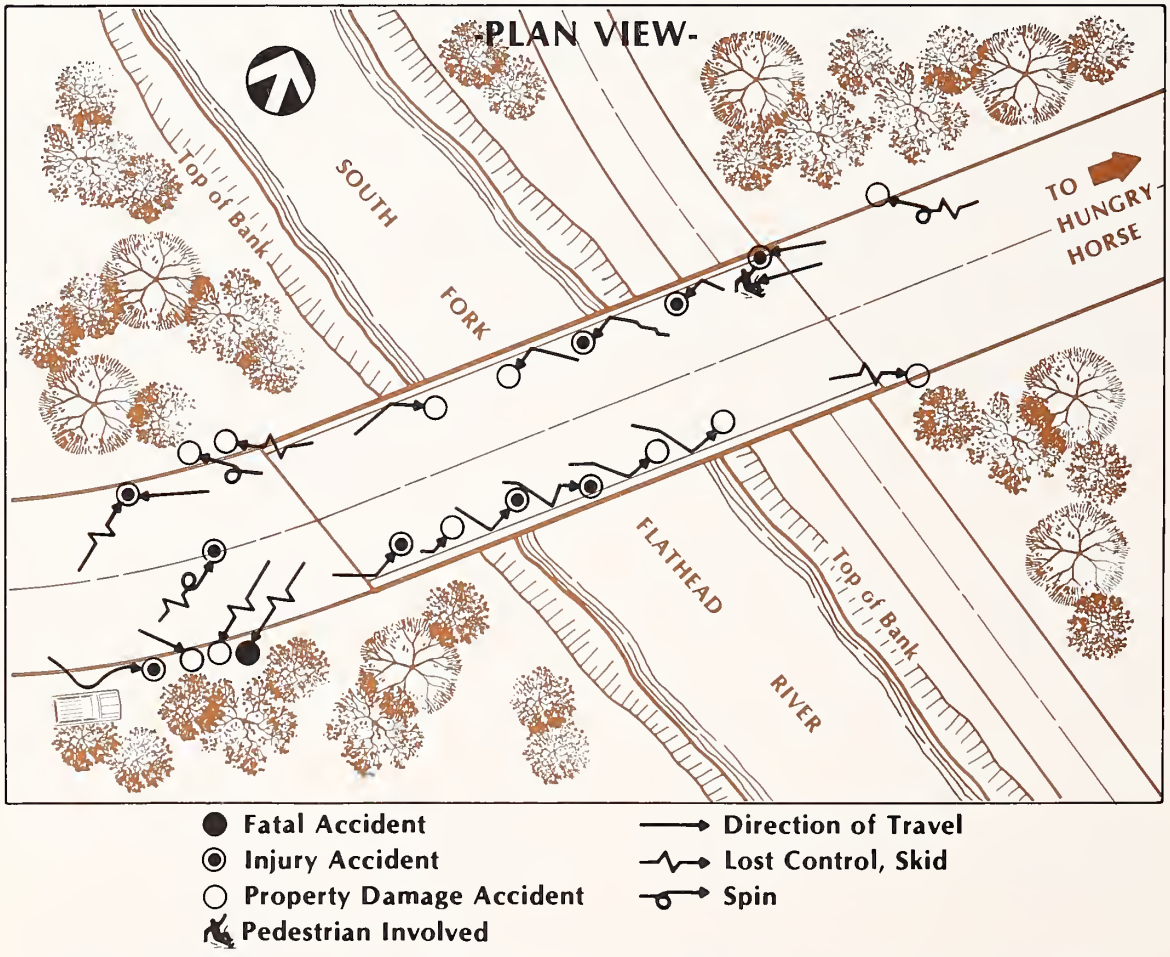


FIGURE 23 – ACCIDENT DIAGRAM-SOUTH FORK FLATHEAD RIVER BRIDGE (1/1/72-12/31/80)

E. CULTURAL, RECREATIONAL, AND VISUAL ENVIRONMENT

1. HISTORICAL & ARCHAEOLOGICAL

a. Historical Background

Prior to the early 1800's, the land in the study area was wilderness inhabited by Indians of the Salish Tribal Nation. The earliest record of white man in the Flathead River drainage occurred in 1809 when David Thompson, working for the Northwest Fur Company, explored the area and eventually established a trading post in the present-day Thompson Falls area. The Hudson Bay Company also expressed interest in the region and established facilities on Lake Pend d'Oreille. Hugh Monroe, a fur trader who lived with the Blackfeet tribe, is credited with being the first white man to see Glacier Park (in 1815). Early trappers in the area were primarily concerned with obtaining beaver and marten pelts. Trapping continued to be the primary activity until the late 1800's, when homesteading began in the area.

The rate of settlement in the upper Flathead Valley increased as a result of the Great Northern Railway, which was constructed through the valley of the Middle Fork in 1891. Columbia Falls and Belton (West Glacier) were established as railroad stations in the same year. Development was also stimulated by mineral discoveries in the Flathead Valley. Coal was discovered on the North Fork and gold and copper were discovered in the eastern portion of Flathead Valley in the late 1890's. A placer mine was located just downstream from Hungry Horse, but no significant amounts of gold were produced.

The lumber industry in the Flathead began after the construction of the Great Northern Railway. The area always had extensive stands of timber, and the coming of the railroad provided a means to ship timber out of the area economically. By the 1930's, several large sawmills had been established in the Flathead Valley and lumber was being shipped to many eastern states.

The construction of Hungry Horse Dam during the late 1940's and early 1950's and the construction of the Anaconda Aluminum plant near Columbia Falls in 1956 spurred growth in communities in the valley and required the improvement of many public facilities.

b. Archaeological & Historical Data

In order to assure compliance with Executive Order 11593, on-site cultural resource surveys for the project were conducted by an archaeological survey team headed by Dr. Charline G. Smith, Associate Professor of Anthropology at the University of Montana. The surveys, which were conducted during the summers of 1977 and 1978, found no surface evidence of historic or prehistoric cultural materials within the project limits.[48] In addition, the Montana Historical Society, Historic

Preservation Office and the Forest Archaeologist for the Flathead National Forest were consulted regarding the presence of archaeological or primitive sites within the study area. No such sites were identified within the project limits through these inquiries.[49,50]

Two sites of historic significance, the Belton Chalets and the Belton Railway Depot, were identified within the study area. Both sites are located near the project terminus at West Glacier. The Belton Chalets is included in the National Register of Historic Places and the Belton Railway Depot was recently determined to be eligible for inclusion in the National Register.[51,52] Neither site is located within the existing highway right-of-way and no additional property will need to be taken from either site. Consequently, there will not be any effect on the historic sites. This determination has been coordinated with the State Historic Preservation Office.[51,53]

2. RECREATION

The U.S. #2 route is heavily used, primarily during the summer months because it provides access to a number of different outdoor recreational opportunities. Recreation uses in the vicinity of the study area corridor include swimming, boating, water skiing, hiking, camping, horseback riding, fishing, hunting, snow skiing, skating, snowmobiling, and scenery viewing. These leisure activities attract an increasing number of tourists each year, as well as some new residents. The locations of non-urban developed recreation sites in or near the project corridor are shown in Figure 24.

The nature of the recreation activities which attract the tourist user makes the intensity of use dependent on the climate. Generally, July and August have more precipitation-free days than any other months and consequently hiking, camping, fishing, driving for pleasure, and picnicking are most popular during this period.

The proximity of the corridor to Glacier National Park also creates a seasonal demand for outdoor recreational facilities. The majority of the yearly visitation to Glacier National Park occurs from May through September with peak visitation in July and August. In 1976, visitation exceeded 1.66 million, the highest yearly total in park history. Visitation and usage of Glacier National Park facilities have fluctuated in recent years, dropping to a low of 1.45 million visitors in 1979. However, visitation records at the Park show a resurgence during 1981 with visitation reaching a new record level of 1.78 million, 21 percent over the 1980 level.[54,55]

The highway also passes near the North, South, and Middle Forks of the Flathead River (all part of the Wild and Scenic River System) which are used heavily for recreation, primarily floating and fishing.

3. VISUAL RESOURCES

This highway project lies in an area of strong contrasts between close, dense forests and dramatic high mountains that surround the broad Flathead riverbed from Hungry Horse to West Glacier. Changes in topography and mixed vegetation provide visual relief and scenic changes at different viewpoints.[56]

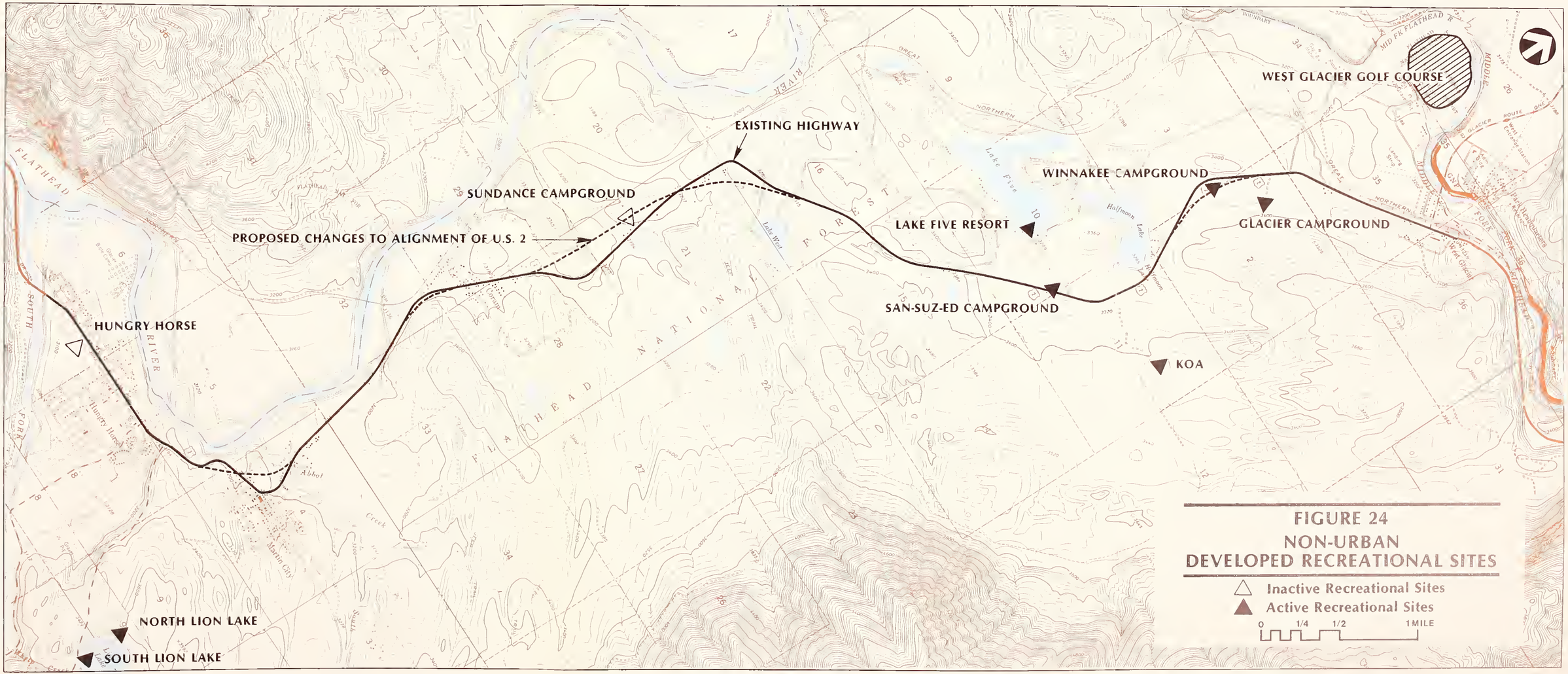


FIGURE 24
NON-URBAN
DEVELOPED RECREATIONAL SITES

△ Inactive Recreational Sites
▲ Active Recreational Sites

0 1/4 1/2 1 MILE

These natural visual resources are offset by random developments such as the existing highway, power lines, railroad, and residential and commercial structures. The physical presence of man has created an intrusion into the naturalness of the area, resulting in a disjointed visual image. In some cases, the visual image is complemented by rustic and natural buildings; but in most instances the inconsistent appearance of wood frame and metal buildings detracts from the natural appearance of the area.

The two viewpoints of importance are from within the highway corridor and from the river. Other viewpoints are either hidden by dense forest or are inaccessible and would not be affected. This entire highway corridor is generally hidden from sight when viewed from a distance.

From the South Fork Bridge through Martin City tree stands to the northwest of the highway provide an effective screen between the highway and the river despite their close proximity, and are considered a valuable visual resource. From Martin City to the Vista Motel there is more visual variety and contrast consisting of changes in topography, open meadows, varieties of tree species, and ever-present human development. From the Vista Motel to the termination of the project at West Glacier, narrow stands of evergreens leading to low hills with mixed aspen and evergreen stands northwest of the highway screen the railroad from the highway and provide a distraction from the commercial development on the southeast side of the highway. This narrow stand of trees is a visual resource which should be protected. Other resources consistent throughout the length of the highway corridor include strong, high mountain shapes in contrast with dense forest containing a variety of tree species, and occasional meadows.

The nature of the human structures influences the visual resources. At ground level there are generally residential or commercial structures. The buildings that are rustic or rural in nature, such as the farm buildings north of the highway near Coram, blend in with and complement the visual impact of a scene. By contrast, the careless appearance of many of the wood frame and metal structures is not consistent with the character of the area and detracts from the visual image.

F. ENVIRONMENTALLY SENSITIVE AREAS AND ISSUES

Much of the uniqueness in character of the Hungry Horse - West Glacier area is due to the surrounding natural environment. The many natural features of the area have more than just a local significance, since visitors from throughout the state and the nation travel to the area to experience them. The area's unique character is sensitive to changes in the environment and many efforts have been made to ensure that the area will continue to be preserved for future generations.

Throughout the course of this study, several areas and issues of regional significance have been identified. Each is important and environmentally sensitive in its own right. The major environmentally sensitive areas that were identified include: 1) Glacier National Park;

2) the Great Bear and Bob Marshall Wilderness Areas; 3) the Wild and Scenic River designation of the Middle Fork of the Flathead River and its accompanying River Management Zone; 4) Bad Rock Canyon; and 5) the Coram Experimental Forest.

The following narrative briefly discusses each of these five environmentally sensitive areas. Figure 25 shows the location of these areas in relation to the proposed project. Since the project does not encroach into any of these areas, the proposed highway is expected to have negligible impact on these environmentally sensitive areas.

1. GLACIER NATIONAL PARK

Glacier National Park is a combination of spectacular mountain peaks, glaciated valleys and diverse wildlife and vegetation which constitutes a priceless national resource. The nearly 982,000 acres of Glacier National Park is an international peace park which serves as an attraction to Canadian citizens and fosters international cooperation for the management of the environment. In 1974, Glacier National Park was granted world stature through its designation as a World Biosphere Reserve by the United States Education, Scientific and Cultural Organization (UNESCO). This stature is significant since Glacier National Park will be involved in international research and management activities aimed at preserving the terrestrial environment.

In 1980, the National Park Service surveyed managers and personnel of all Park Service units in an effort to identify and characterize threats to the natural and cultural resources of each unit. Threats to park resources include "those pollutants, visitor activities, exotic species, industrial development projects, etc. which have the potential to cause significant damage to park resources or to seriously degrade important park values or park experience."[57]

The significant findings of the threats survey are summarized as follows:[57]

1. A wide range of internal and external threats are causing degradation of the resources of park units of all sizes, use categories, and ecosystem types.
2. National Park natural areas greater than 30,000 acres reported an average number of threats twice the service-wide norm.
3. The twelve Biosphere Reserve Parks reported an average number of threats three times the service-wide norm.
4. More than 50 percent of the reported threats were attributed to sources or activities outside park boundaries. Most frequently cited threats were: industrial and commercial development projects adjacent to parks, air pollutant emissions, urban encroachment, and roads and railroads.
5. Scenic resources were reported to be significantly threatened in 60 percent of the parks. Air quality resources were reported as threatened in 45 percent of the parks and threats to mammals, plants or fresh water resources were reported in over 40 percent of the parks.

The threats survey conducted for Glacier National Park identified 56 of 75 possible threats to the park environment. Glacier National Park

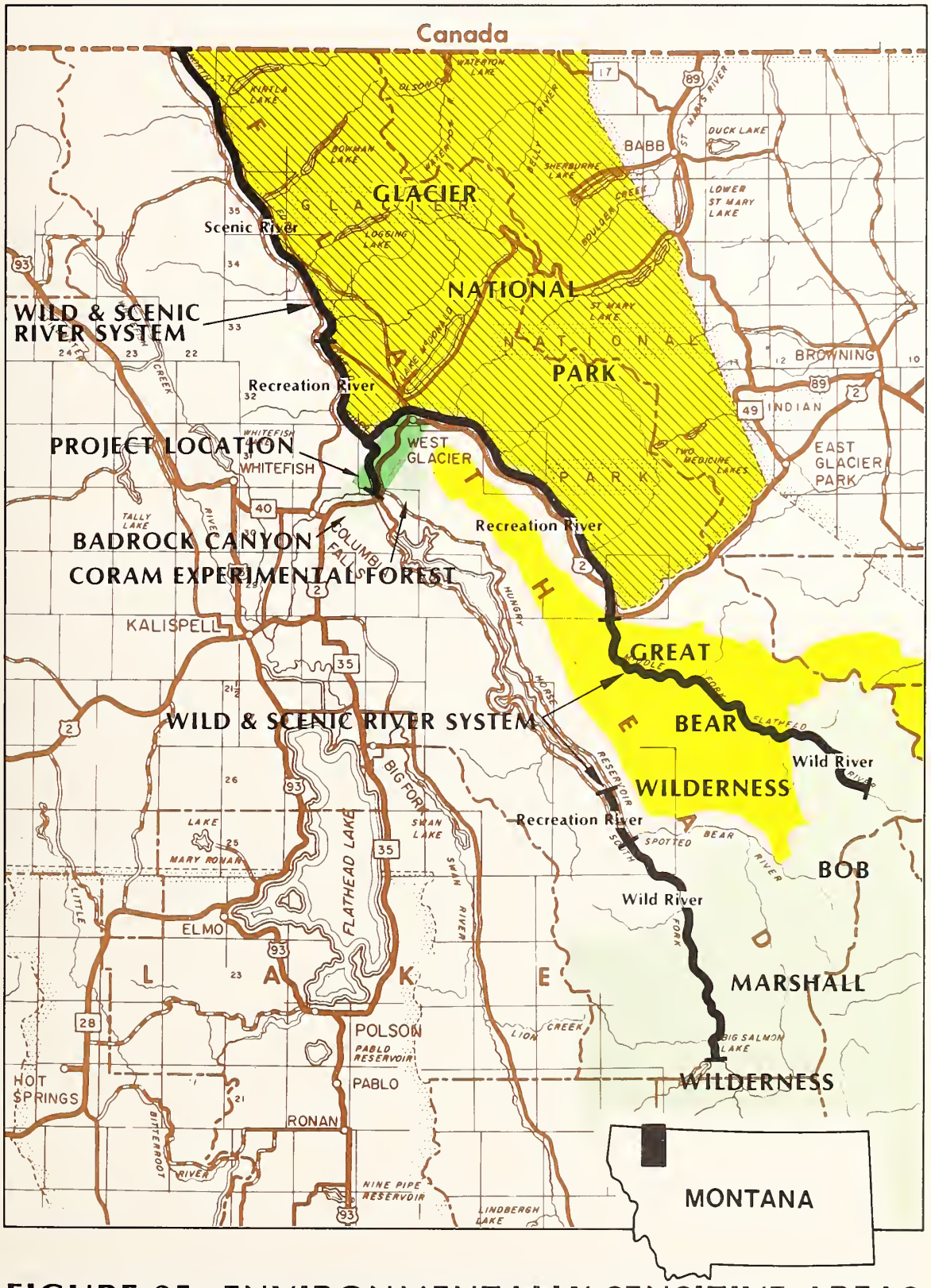


FIGURE 25–ENVIRONMENTALLY SENSITIVE AREAS

reported the most threats of any national park and ranked fourth in the number of reported threats among all 326 Park units. Aesthetic resources are reported as being the most threatened resource category. These resources include subjective features such as the general scene (vistas, wildfire scars, etc.), the wilderness/natural scene, and the "park experience". Threatened biological resources include significant plant communities, terrestrial mammals, and endangered and threatened species. The most threatened physical resource in the Park was reported to be water quality. The external threats to Park resources include urban encroachment and land development adjacent to the Park, roads and railroads, mining and associated activities, logging operations, and industrial development. Internal threats to Park resources are presented by the pine beetle infestation and through visitor use impacts.[58]

General development concepts presented in the Glacier National Park/Montana Final Master Plan indicate that in the future, the National Park Service Headquarters and major access to the Park will remain at West Glacier. The Master Plan also proposes little development within the Park and relies upon nearby communities to provide the necessary accommodations. This policy may shift some visitor use impacts to these adjacent communities.[59]

2. WILDERNESSES

The natural character of the Flathead River region is preserved in two wilderness areas located southeast of the study area. The Great Bear Wilderness and the Bob Marshall Wilderness are comprised of 285,771 and 949,356 acres, respectively. Together, these wilderness areas account for more than 40 percent of the designated wilderness and primitive areas in Montana. The wilderness areas are maintained in their natural undeveloped states and offer recreational, scenic, educational, conservation and historical opportunities to visitors. Wildlife is especially abundant in both areas. Access to both wilderness areas is available from U.S. Highway 2 at Martin City by means of Flathead County and Flathead National Forest roads to the Spotted Bear Ranger Station. Visitor use through this access point is substantial. The Great Bear Wilderness is accessible from U.S. Highway 2 at several locations between West Glacier and Nimrod. Trailheads at Ousel and Great Bear creeks are located within ten miles of West Glacier.

Two additional roadless areas were selected by the Forest Service for potential addition to the National Wilderness Preservation System. These areas included the Middle Fork - Continental Divide New Study Area, which coincides with much of the present Great Bear Wilderness, and the Middle Fork Inventoried Roadless Area. None of the inventoried areas, other than that included in the Great Bear Wilderness, have been designated as wilderness or are programmed for additional study at this time.

The Great Bear and Bob Marshall Wildernesses are currently faced with common problems. Overuse of particular areas of both wildernesses has caused damage to the natural environment, and indications are that visitor use will increase in the future. Probably the most sensitive issue confronting managers of wilderness areas at the present time is that

of oil and natural gas leasing and exploration activities within wilderness areas. Currently, a moratorium prohibiting exploration activities is in effect in both the Great Bear and Bob Marshall Wilderness Areas.

It is noted that 92 percent of Glacier National Park has been proposed for wilderness classification and is presently managed as such.

3. WILD & SCENIC RIVERS

The National Wild and Scenic Rivers Act of 1968 [P.L. 90-542, Section 5(a)] directed the Department of Agriculture to study the Flathead River System and determine whether it merited inclusion in the National Wild and Scenic River System. Criteria considered in the determination of Wild and Scenic River status included: "1) free-flowing status; 2) the presence of high quality water; and 3) the fact that the river with its immediate environment, possesses outstanding remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values."[60] Study findings indicated that designated portions of the Flathead River system qualified for inclusion in the National Wild and Scenic River System. The passage of Public Law 94-486 (An Act to Amend the Wild and Scenic Rivers Act) in 1976 added the designated sections of the Flathead River to the National Wild and Scenic Rivers System. Flathead River segments were classified as Wild, Scenic, or Recreational, depending upon the land use and the potential quality and type of recreational opportunity each presents to the public. The Middle Fork of the Flathead River, which flows in close proximity to U.S. Highway 2, has been classified as a Recreational River. This classification emphasizes "the free-flowing and unpolluted waters, ready public recreational access, potential for accommodating large numbers of recreationalists with a wide variety of recreational experiences provided, and high scenic values" of the river segment.[60]

In order to maintain the special qualities of a designated river section, corridors or River Management Zones were also established by Congress. Considerations used to determine the boundaries of the River Management Zones include: 1) the area visible from the river; 2) special features; 3) location of property lines and roads; 4) potential problem areas; 5) land ownership and use; and 6) the possibility of river shifting. U.S. Highway 2 falls within the river corridor at locations near Coram and West Glacier.

The Wild and Scenic River Act also provides for the protection of the resources in the river corridor through the acquisition of scenic easements on private lands adjacent to the river. Scenic easements are intended to maintain river values and insure that overdevelopment of private lands does not occur in the future. Lands under scenic easements generally remain in private ownership; however, lands may be acquired through fee purchase or through the power of eminent domain.

Administration of the Flathead Wild and Scenic River is primarily the responsibility of the Forest Service. Glacier National Park and the State of Montana are responsible for the management of their lands within the river corridor.[60,61]

The Flathead Wild and Scenic River Management Plan recognizes the resources of a particular river segment and identifies the management guidelines necessary to preserve them for future generations. The

Plan also recognizes that river use and the development of private lands within the River Management Zone will continue. Management guidelines pertaining to roadway improvements and rehabilitation of U.S. Highway 2 or development along the highway include:[60]

1. Manage the use of the river and public and state lands within the corridor to preserve or enhance river values;
2. Foster the preservation of wilderness values of Glacier National Park lands;
3. Provide and develop suitable public access to the river and its corridor;
4. Allow vegetative manipulation in the river corridor in connection with the construction and maintenance of appropriate developments or to reduce a safety hazard;
5. Minimize impacts on views from the river;
6. Review road reconstruction plans for U.S. Highway 2 in light of protecting identified river and associated values;
7. Provide protection of private lands from overdevelopment and incompatible structures and improvements with scenic easements.

4. BADROCK CANYON

U.S. #2 passes through Badrock Canyon approximately one mile to the west of the western end of the project. In addition to the highway, a power line is located near the canyon on the south side of the river, and the railroad passes through the canyon on the north side of the river. The canyon has both geographic and historical significance to this portion of the upper Flathead Valley. The canyon walls temporarily restrict the meandering of the Flathead River and provide a transition from the Kalispell Valley to the narrower Flathead River corridor.

Badrock Canyon is thought to be the site of a battle between the Flathead Indians and a neighboring tribe of plains Indians. The plains Indians crossed over the divide and raided the Flathead Indian tribe of horses, etc. A fierce battle ensued and many Flathead warriors were killed. Since that time, the area has been known as Bad Rock Canyon.

There are several memorials to local citizens within Badrock Canyon. Berne Memorial Park, named after an original homesteader of the area, consists of six acres of land donated to the public by the Berne family. A fountain and spring located at a rest area in the Canyon are dedicated to two individuals who provided outstanding service to local communities during their lives.

Badrock Canyon has been identified as an important migration corridor for bald eagles. The canyon area is used as a feeding, perching, and roosting area by a number of eagles during periods of migration.

5. CORAM EXPERIMENTAL FOREST

The Coram Experimental Forest consists of nearly 7,500 acres of timberland within the Flathead National Forest. The reserve is located approximately two miles east of U.S. Highway 2 between Martin City and Coram. Primary access to the Forest is provided by the Desert

Mountain and the South Fork (Abbot Creek) Roads, which ultimately join U.S. Highway 2 at Martin City.

In 1933, the Coram Experimental Forest was established after the reserve was recognized as being representative of western larch - Douglas fir forests. The Forest has been the site for extensive studies in many aspects of forestry by state and federal agencies since 1946. Within the Forest, an area of approximately 800 acres is designated as the Coram Natural Area. Virgin conditions are permanently maintained to provide baseline data for monitoring changes in western larch - Douglas fir forests of the region.

In January, 1977 the Coram Experimental Forest was designated as a Biosphere Reserve by the United Nations Educational, Scientific and Cultural Organization. This designation gave the Forest world stature as a reserve set aside for international research and for the preservation of the terrestrial environment.

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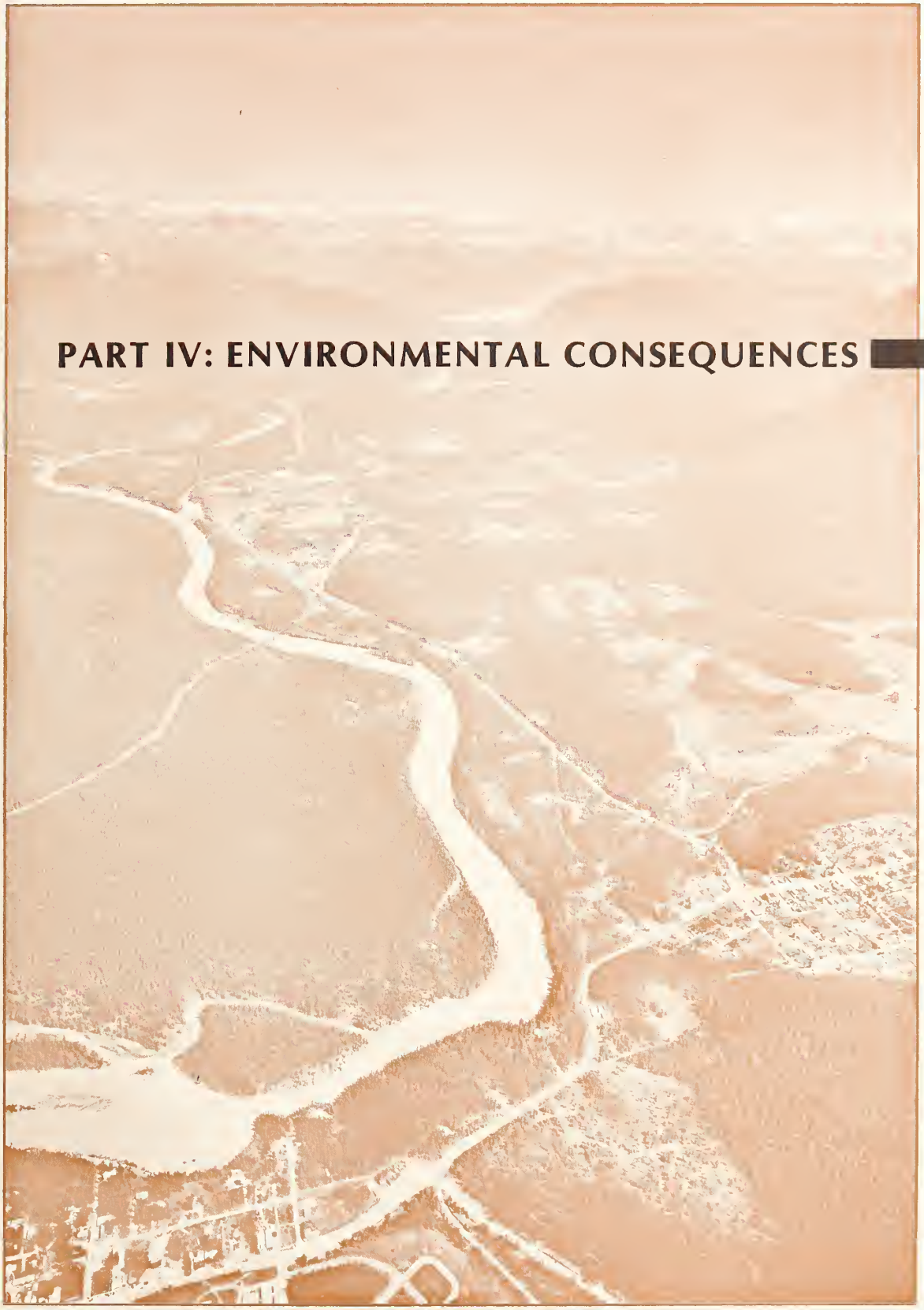
PART IV: ENVIRONMENTAL CONSEQUENCES



PART IV: ENVIRONMENTAL CONSEQUENCES

A. INTRODUCTION

Using as a baseline the existing conditions summarized in the preceding chapter, the impacts for each of the highway alternatives proposed have been projected and evaluated. Potential impacts were explored according to the categories previously discussed. The comparison of the potential impacts for each alternative highway design provides an objective means by which the alternatives can be evaluated and a preferred alternative selected.

It should be pointed out that the projection of potential environmental impacts is a process with inherent limitations. Where possible, empirical and/or mathematical models have been used to quantify impacts. This is generally the case with direct impacts of the proposed highway since the direct impacts are usually more apparent. However, indirect or secondary impacts (impacts related to factors other than the construction and the physical presence of the highway such as growth due to better access, land use changes, etc.) are generally less obvious and more difficult to assess. Where possible, these secondary impacts have been quantified, and where this was not possible, the secondary impacts were discussed in descriptive terms.

B. PHYSICAL ENVIRONMENT

1. GEOLOGY AND SOILS

New highway construction would pass through one major bedrock formation in the area. The Siyeh formation, consisting of Precambrian-age limestone and dolomite, forms a distinctive ridge just east of Hungry Horse. This formation is encountered by other local roads in the area, most notably the road to Hungry Horse Dam and Reservoir. The nearly vertical road cuts in some locations along the road indicate that the formation is relatively stable and rock slides or slumps do not occur often. Blasting may be required to achieve the necessary road cut depth (possibly more than 30 feet) in several locations along 700 feet of roadway which passes through the Siyeh formation.

Most surface materials encountered in the area of the proposed project are the result of alluvial or glacial deposition, which is ideally suited for roadway construction. Most of the material excavated from road cuts would serve as satisfactory fill material. Localized areas of thin soil, high groundwater, or cut bank instability may be encountered during roadway construction but would present minor limitations to road building. Exposed fresh surfaces and previously excavated material would be susceptible to erosion by surface runoff.

The impacts on the geology and soils of the proposed project area would be similar for all improvement alternatives; however, the extent of this impact varies somewhat by alternative. Each improvement alternative utilizes similar design considerations but construction quantities (i.e., cuts, fills, gradients, etc.) would differ. Road grades and sight distances would be less critical with the four-lane alternatives than with the two-lane alternatives and the depth of road cuts and fills would be somewhat less for the four-lane alternatives as compared to the two-lane alternatives. The quantity of excavation for the four-lane construction alternatives would be greater than with the two-lane alternatives due to the increased width of the roadway.

The impacts on geology and soils are common to any highway construction project, with no unusual problems anticipated. Impacts on geology and soils are therefore considered minimal for all alternatives.

2. WATER RESOURCES AND QUALITY

a. Surface Waters

Impacts to surface water resources primarily involve the potential water pollution associated with stormwater and snowmelt runoff. The drainage of the highway structure, coupled with generated or accumulated pollution loads from the highway, provide the mechanism by which pollution of surface waters can occur. Two types of pollution sources can be involved in a given highway design: 1) non-point source discharges; and 2) point source discharge. Both types of pollution sources are considered in the following discussion.

1) NON-POINT SOURCE POLLUTION

Modeling techniques have been developed for predicting the types and concentrations of pollutants generated by functioning highways. One of the models currently available was published by the FHWA in February, 1981.[1] This model was used to predict pollutant generation and surface water quality impacts for the highway alternatives proposed.

Highway length, shoulder design (e.g, curbed or uncurbed), and average daily traffic (ADT) are the primary input parameters for the model. Roadway width and number of lanes do not significantly affect the pollutant load generated by the roadway.[2] Since the highway alternatives all have similar shoulder types and comparable traffic volumes, the FHWA model indicates that resulting pollutant loads for the alternatives will be essentially the same. The primary pollutant contained in urban and highway runoff is total solids, a sizable fraction of which becomes suspended solids in water. Associated with these total solids are nutrients, heavy metals, and organic compounds.[3]

To evaluate a conservative (worst case) situation with respect to pollutants generated by the highway alternatives, the following approach was used. It was assumed that all pollutants (solids) generated by an ADT of 5,000 vehicles per day along a 10.8-mile route would be discharged directly to the Middle Fork of the Flathead River. These assumptions are very conservative in that: 1) the ADT is higher than recorded; 2) the washoff of pollutants accumulated from the highway corridor would be less than the total generation; 3) in an overland drainage situation, significant absorption of pollutants would occur in the soil and vegetation prior to the runoff reaching the Flathead River or any other body of water; and 4) the pollutant generation of the entire 10.8-mile corridor would be distributed along a comparable stretch of the mainstream and Middle Fork of the Flathead River rather than being delivered directly to the Middle Fork, where average annual flow is only half of that in the mainstream.

Based on the FHWA model, Table No. 15 summarizes the fifteen most significant pollutants that would accumulate along the highway in the course of a year.[4] This total annual generation of pollutants is assumed to be washed off the corridor and diluted by the average annual flow of the Middle Fork of the Flathead River to yield the concentration of each pollutant contributed to the river. As indicated in the table, this concentration is compared to the background concentration reported in the river based on USGS and MDHES data, and the allowable concentration in the river based on the MDHES B-1 water quality designation. It is noted that no special water quality standards have been set for Wild and Scenic Rivers, which include portions of the Flathead River.[5]

It is apparent from Table No. 15 that the non-point source pollutant contribution from the highway is so small that no adverse impact would be caused to the surface water quality of the Flathead River or any other surface water resource in the area. Also, the solids contributed by any highway alternative would be negligible in comparison to those naturally generated in the corridor's watersheds. Nutrient contributions would also be insignificant; the phosphorous contribution anticipated from the highway would have no discernible effect on the phosphorous budget of either the Flathead River or Flathead Lake. Trace heavy metals and asbestos would likewise cause no impact due to the minute concentrations involved.

TABLE NO. 15

PREDICTED ANNUAL POLLUTANT LOADS TO MIDDLE FORK OF FLATHEAD RIVER

POLLUTANT	TOTAL ANNUAL GENERATION[1] (LBS/YR)	POTENTIAL CONTRIB.[2] (MG/L)	RIVER CONCEN.[3] (MG/L)	MDHES CONCEN.[4] (MG/L)
Total Solids	54,000	--	--	--
Suspended Solids	17,000	0.003	2.6[5]	25.0[6]
Volatile Suspended Solids	3,300	0.0006	--	--
Total Kjeldahl Nitrogen	170	0.00003	0.09-0.24	0.35[7]
Total Organic Carbon	3,700	0.0006	2.0	--
Chemical Oxygen Demand	4,700	0.0008	0.0-0.8	--
Phosphate	120	0.00002	0.001-0.05	0.05[8]
Iron	760	0.0001	0.01-0.04	0.3
Lead	22	0.000004	0.01-0.04	0.05
Chromium	12	0.000002	0.001	0.05
Copper	4.0	0.0000007	0.01-0.03	1.0
Cadmium	2.2	0.0000004	0.01	0.010
Mercury	0.31	0.00000005	0.001	0.002
Asbestos	2.5	0.0000004	--	--
Zinc	14	0.000003	0.01-0.04	5.0

1 Predicted annual generation based on FHWA Predictive Procedure (FHWA Report No. FHWA/RD-81/044) for an ADT of 5,000 vehicles between Hungry Horse and West Glacier.

2 Contribution to the Middle Fork of the Flathead River is based on the assumption that all pollutants generated reach the Middle Fork where the average flow is 3,000 cfs.

3 Based on USGS and MDHES water quality data; characteristic values or ranges are shown.

4 Based on 1979 Secondary Drinking Water Standards and revisions as referenced in MDHES "B-1" Water Quality Designation.

5 Concentration during periods of low flow.

6 U.S. Department of the Interior guideline to safeguard freshwater fisheries (no standard exists).

7 MDHES-suggested guideline for total inorganic nitrogen (no standard exists).

8 MDHES-suggested guideline for total phosphorous (no standard exists).

Over the past five years, de-icing salt (sodium chloride) used on the existing highway has averaged 28,000 pounds per winter, applied in combination with sand. The salt is mixed with sand to soften snow-packed roadways and keep damp sand from freezing in application machinery. This application is much less than usual salt applications used for snow and ice control typical of midwestern states.

Since sanding, and thus salt requirements, are directly related to the roadway surface area involved, the existing application could be expected to increase with increased highway widths. Conservatively assuming that this entire quantity was discharged directly to the Middle Fork of the Flathead River and was diluted by the average annual flow thereof (similar to the comparison presented in Table 15), a rise in the ambient sodium and chloride concentrations of 0.01 mg/l could be expected. This compares with existing ambient concentrations of 1.0 mg/l dissolved sodium and 0.4 mg/l chloride. Such a conservative oversimplification obviously ignores many mitigating influences such as vegetative and soil attenuation of the salt load. "No effect" levels reported in the literature for salmonids and other cold-water biota are in excess of 1,000 mg/l. Threshold concentrations for human taste are reported to be anywhere from 200 to 900 mg/l. For cardiac patients, a limit of 10 mg/l is recommended.[6] Recognizing the many-fold factor of safety involved, no adverse impact is possible. A hazard to domestic or municipal water supplies is likewise impossible. Obviously, a radical increase in roadway salting activity could alter the situation, but this would have to involve an increased salt application of many, many times greater than present policies.

Due to the comparatively low salt applications used along the corridor, discernible adverse impacts to groundwater from non-point runoff discharges containing sodium chloride would not occur. Current modeling techniques for the influence to domestic wells from roadway salting indicate that even in a "worst case" situation; i.e., a domestic well situated only 20 feet from the roadway where a substantial length of highway drains toward the well and where groundwater is but 20 feet from the ground surface, adverse effects are highly improbable.[7] It should be pointed out that the foregoing modeling technique has been empirically developed for dug, rather than drilled, wells. However, the model predicts the amount of salt reaching the groundwater table, and thus provides a good simulation of conditions in the field irrespective of the type of well involved. Other mitigating influences to prevent salt contamination of the groundwater in the study area such as vegetative and soil attenuation provide additional safeguards.

Since washoff of pollutants occurs more thoroughly from roadway pavement than grassed roadsides, it can be assumed that a broader expansion of pavement has comparatively greater pollution potential. However, in view of the conservative assumptions of the preceding model analyses, even the worst case situation would not result in adverse impacts. Thus all of the highway alternatives can be considered as comparable in their generation of non-point source surface water pollution, and that the impact for all of the alternatives would be negligible.

2) POINT SOURCE POLLUTION

Point source discharges would occur where stormwater runoff from the highway was discharged. The Federal Water Pollution Control Act

authorized Discharge Permits for urban stormwater discharges; however, the rural nature of the highway corridor would exempt highway drainage structures from these requirements. The State of Montana, furthermore, has chosen not to implement the federally authorized permit system for such discharges, and no requirement for Discharge Permits for stormwater discharges exists in the state.[5]

The majority of the proposed project is in rural areas where stormwater collection facilities would not typically be provided. The topography of the area assures that most flow that would be channeled in the borrow ditches of the roadway will not flow uninterrupted for long distances and accumulate to a large point source discharge.

The MDHES Surface Water Quality Standards and associated B-1 classification for the waters in the area could not and would not be violated. The MDHES has published a set of guidelines for stormwater runoff, the pertinent recommendations of which are summarized in Table No. 16.[8]

The runoff generated along the corridor could be discharged directly to adjacent watercourses such as the Flathead River without violation of existing water quality standards. This is due to the small size of the catchment areas involved and the correspondingly low flows and pollutant loads generated. However, recognizing the limited opportunity for attenuation of runoff pollutants from point source discharges in the soil or vegetation and the high quality of the surface waters in the area, detention facilities will be provided in areas where stormwater collection systems are used.

Alternatives to the detention-discharge systems were considered but are not practical. Total retention using evaporation and percolation for dissipating the runoff would require excessive land area and would perform poorly due to local climatic conditions. Average annual precipitation for the area exceeds annual evaporation, which offsets any evaporative losses from impoundments. Percolation rates are low, and would not remove adequate water from such systems. Land application of retained runoff would require extensive irrigable land area close to the communities, and an irrigation pumping, distribution and application system. Abundant natural precipitation makes such water applications redundant. Silviculture irrigation of nearby forest land is impractical due to the relatively unproven nature of such technologies and the adequate precipitation. Aside from their technical limitations, the foregoing alternatives would involve significant additional capital expenditures and affect more land area than the proposed detention-discharge system.

Collection systems were proposed through the communities of Hungry Horse, Coram and West Glacier as part of the original highway design for the corridor. These systems were intended to provide drainage for the highway through the communities. Each system consisted of a single storm sewer line paralleling the highway centerline, and serving curbside grated inlets typically spaced one block apart. The storm sewer line(s) converged to an outfall line routed to a stormwater detention pond; thereafter, flow discharged to the river.

At Hungry Horse, an outfall was proposed to run from the highway, along Main Street and River Drive, to a detention facility sited at the southwest corner of the River Drive and First Street West intersection; an outlet pipe from the detention facility would flow directly north to the bank of the Flathead River. The proposed Coram system discharged to a detention pond approximately one-half mile south of the

TABLE NO. 16

SUMMARY OF MDHES STORMWATER RUNOFF GUIDELINES

* Detention facilities shall provide a minimum of 45 minutes of hydraulic detention.
* Detention facilities shall be designed to minimize standing open water.
* Facilities for a new development shall generate peak flows no greater than the peak flows originating from the undeveloped site.
* Treatment facilities shall be designed to maximize retention of sediment and floating materials, including oil and grease.
* Treatment facilities other than detention facilities shall provide treatment at least equivalent to detention facilities.
* Receiving waters of high quality may dictate the use of land application techniques in lieu of point discharge.
* The use of natural features and systems to convey and treat stormwater runoff is encouraged (e.g., grass waterways, wetlands, percolation ponds).
* The use of multiple purpose facilities is encouraged (e.g., combination parks and detention ponds).
* When grass is to be used as a permanent lining, temporary protective linings should be provided or sod should be installed.

community between the Burlington Northern Railroad right-of-way and the highway; an outfall drainage channel was routed from the pond along the south edge of the railroad right-of-way to the river bank adjacent the railroad bridge. In West Glacier an outfall sewer was proposed to the north beneath the existing railroad overpass to a detention pond and outlet drainage channel to the Middle Fork directly across the river from the National Park Service Headquarters. In each of the communities, the central drainage systems were to be supplemented in the outlying areas by drainage channels and culverts as required.

Storm drainage facilities provided in conjunction with any of the four alternatives involving construction will be conceptually similar to these original proposals. Several considerations would be particularly important in the final design of such facilities. The siting of detention impoundments will be contingent on thorough soils investigations including on-site test borings and percolation tests; sealing of the lagoon floors may be necessary. Detention ponds will be sized to afford ample hydraulic detention times; 45 minutes should be considered minimal. Baffles or traps for floating materials will be provided at pond outlets. The pond floors (if unsealed) and dikes along with any outlet drainage channels will be revegetated to resist erosion. Landscaping of the ponds and channels will also be provided. Vegetative screening will be employed at all riverbank discharge structures. Adequate bank stabilization measures will be employed at all riverbank discharge structures.

A Corps of Engineers Section 404 Permit will be required for those areas where riprap is installed below ordinary high water mark to stabilize the banks for point discharges from storm drainage systems.

With such properly designed detention facilities, the point source

discharges generated under any of the alternatives will not create significant adverse surface water quality impacts to the watercourses of the area, nor will any adverse secondary impacts result.

3) OTHER IMPACTS

No direct alteration of any existing drainage way or channel is anticipated due to implementation of any of the alternatives proposed. One perennial stream crossing (Abbot Creek) and two intermittent stream crossings are encountered along the corridor. The natural channel configuration and bottom characteristics would be maintained at these crossings as much as possible. Stream crossings or other modifications to flood plains would be designed to preclude aggravation of flooding. Appropriate design allowances to protect the fishery resources of Abbot Creek will be included.

The Department of Highways would coordinate with the Department of Fish, Wildlife and Parks prior to construction of any stream crossing to determine the necessary construction methods required at the crossing to protect the fishery and aquatic biota.[9] The use of cofferdams to isolate the work area, scheduling of construction around spawning seasons, and approval of the proposed type of structure to be installed are typical methods that will be used to protect streams.

Corps of Engineers Section 404 Permits will be required for the installation of the drainage structure at Abbot Creek. Approximately 4,000 cubic yards of fill would be placed below the ordinary high water mark (maximum 3,900 c.y. for the 44-foot alternative and 4,300 c.y. for the 88-foot alternative). Since the Abbot Creek facility will be designed to handle major floods and the fill into the flood plain is minor, impacts will be negligible and no special construction other than standard erosion control practices will be required.

b. Groundwater

The greatest potential for adverse impacts to the groundwater from any given alternative highway would be through contamination of the surface water that subsequently reached the groundwater. As documented in the preceding section, no contamination of the surface waters in the area is expected, and therefore the groundwater would similarly be safeguarded.

A secondary potential impact could exist with the percolation of polluted stormwater runoff through the soil to the underlying groundwater. This is improbable due to the nature of the contaminants related to stormwater runoff. A primary constituent is settleable and suspended solids, both of which are effectively removed by physical filtration in both vegetation and the first few feet of topsoil. This phenomenon would not occur in a surfacial strata of fractured bedrock, but such formations are not typical of the surface structure of the area without some covering of topsoil. The trace heavy metals typical of highway runoff are very effectively attenuated by the clay particles in the soil.[10] Recognizing the clay fraction typical of the area soils, this effect would also result in effective removal of trace heavy metals in the upper few feet of the soil. Thus no adverse impacts to groundwater as a result of percolation of contaminated water are anticipated with any alternative under consideration.

3. AIR QUALITY

No significant air quality impacts are expected with any of the alternatives discussed in this study. Air quality problems are generally associated with urban areas that have large volumes of traffic, traffic congestion, and industry. This highway is in a sparsely populated rural area with low ambient air pollution, particularly in the winter months during critical inversion periods. The proposed project alternatives would not generate any substantial additional traffic beyond anticipated natural increases along this route, and thus it is not anticipated that the new roadway would generate a significant increase in air contaminants.

Recent discussions with representatives of the Montana Air Quality Bureau indicate that they do not expect the proposed project to cause air quality in the study area to degenerate. They feel that improvements in traffic flow, widening of roadway shoulders, and use of curbs and gutters in the small communities should actually reduce air contaminants and improve air quality in the area.[11]

Total suspended particulates should not exceed national ambient air standards (260 mg/m^3 24-hour maximum and 75 mg/m^3 annual geometric mean) or Montana standards (200 mg/m^3 24-hour maximum and 75 mg/m^3 annual arithmetic average - mg/m^3 is micrograms per cubic meter).[11] Particulates would normally increase with increasing traffic to the design year, as would be expected with the no-build alternative, but use of a shoulder and curbs and gutters in the communities should offset the increase in traffic. Better emission controls on newer automobiles should reduce engine-generated particulates.[12]

Gaseous emissions should not have a significant impact on air quality. Nitrogen oxides and sulfur oxides are not expected to be generated in significant amounts to impact the environment along the proposed corridor. Levels of carbon monoxide were considered in the greatest detail, since this is the pollutant most frequently violating national standards. Use of a screening method presented in EPA-450/3-78-035 showed no potential hot spot (potential site exceeding national ambient air quality standards) for carbon monoxide. The most likely site was in Hungry Horse; however, use of the Hot Spot Verification Method presented in EPA-450/3-78035 showed levels of carbon monoxide for the worst case situation would be well within standards. (Documentation of the detailed analysis summarized herein is on file with the Montana Department of Highways in Helena.)[13] This project is in an area where the State Implementation Plan does not contain any transportation control measures. Therefore, the conformity procedures of 23 CFR 770 do not apply to this project. (Part 770 of the Code of Federal Regulations No. 23 contains air quality guidelines for use in Federal Aid Highway Programs.)[14]

4. NOISE

The land use or activity noise level impacts are established by comparing existing and projected noise levels with the FHWA design noise levels. Noise abatement measures are not required for lands which

are undeveloped at the time of location approval; however, for the purposes of this study, it was assumed that noise levels should be kept within the 'B' category to minimize noise impacts on future development that may occur. Land use category 'B' includes picnic areas, recreation areas, playgrounds, residences, motels, hotels, schools, churches, libraries, and other similar uses.[15] The L_{10} (level of sound exceeded ten percent of the time) for land use category 'B' is 70 dBA.

In order to determine the impact that the proposed project would have on noise levels, a computerized version of the manual noise prediction model (SNAP1) developed by the FHWA was utilized.[16] Based on this model, it was determined that there would not be a serious impact on the noise environment along the route of the proposed project. A majority of the proposed roadway follows the alignment of the present highway and, where alignments differ, there is only sparse human habitation. Using the impact criteria summarized in Figure 26, there are only seven sites receiving impact due to increased noise levels on a highway corridor of nearly 11 miles (see Table No. 17). All resultant sound levels remain well below the maximum design levels for Land Use Category B.[15] It should also be noted that noise level differences between the two-lane and four-lane alternatives would represent an increase of approximately 1 dBA or less for each site evaluated.

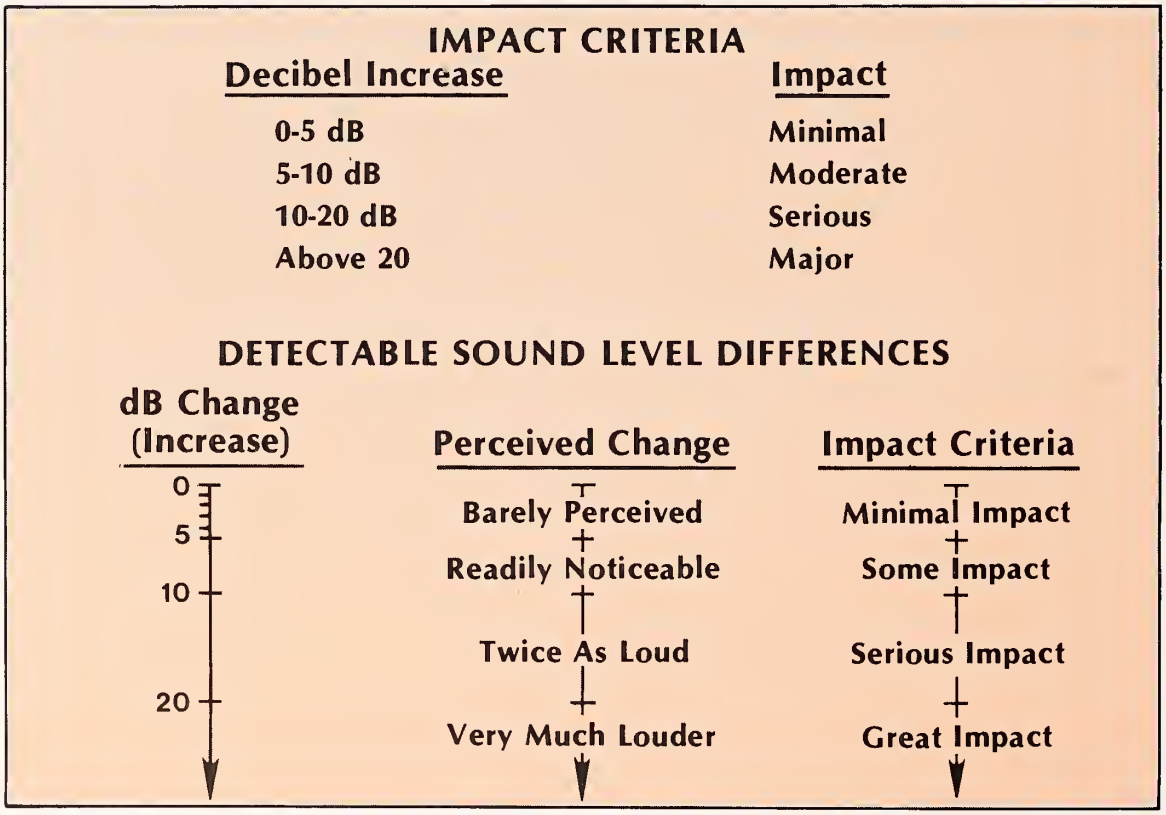


FIGURE 26—NOISE ANALYSIS

TABLE NO. 17

POTENTIAL NOISE IMPACT AREAS

LOCATION	L_{10} 1981 30th HOUR VOLUME	CHANGE 2003 UNIMPROVED	CHANGE 2003 IMPROVED	IMPACT 2003 IMPROVED
Winnakee Campground at Edge Farthest from Present Roadway	57(P)	+2	+13	Major
Residence, Martin City West Side, Lot 10, West of Third Street	61 (M)	0* - +4**	+6	Moderate
Residence, Martin City Northeast Side, Located on Parcel 72 North of Proposed Project	57(P)	+2	+8	Moderate
Residence, Martin City West Side, North of Present Roadway	60(M)	0	+5	Moderate
Residence on Hill Northeast of Coram	53 (M)	+1	+6	Moderate
Sundance Campground Measured Site	55(M)	+7	+18	Major
Sundance Campground West of Proposed Right-of-Way	56(P)	+2	+9	Moderate

M = Measured L_{10}

P = Predicted L_{10}

* SNAP1 Prediction

** Manual Prediction

According to the criteria summarized in Figure 26, the Sundance Campground (Site 8) and the Winnakee Campground (Site 14) have areas that will receive the greatest impact. A portion of the campground located west of the proposed right-of-way would have a year 2003 noise level of 65 dBA compared to a present level of 56 dBA. This would be an increase of 9 dBA during the design period with the proposed project resulting in some impact. The predicted 65 dBA is still, however, substantially below the 70 dBA for Land Use Category B, which would include campgrounds. Traffic studies also reveal that traffic volume decreases dramatically during the evening and nighttime hours, giving a lower noise level during the hours of heaviest use of the campground. (It should be noted that the Sundance Campground is not open this season, and owners of the campground indicated that there are no current plans to reopen the campground in the near future.)

According to the impact criteria summarized in Figure 26, Winnakee Campground would receive an impact on the edge of the campground farthest from the present roadway. The proposed project right-of-way will border this edge. Currently, the noise level in the area is 57 dBA, while the proposed roadway would generate a level of 70 dBA for the design year. This represents an increase of 13 dBA, and would be at the maximum design noise level for this land use category. However, during the night hours from 10:00 p.m. to 7:00 a.m., the maximum traffic is about one-third of what the peak traffic is during the day and noise levels are correspondingly reduced. The maximum nighttime L_{10} would be 65 dBA. Impacts during the nighttime hours would be significantly less when campground use is the highest.

Three residences in Martin City will receive some impact. One is located on the north side, one on the west side, and the other on the south side of Martin City. One residence northeast of Coram will also receive some impact. It is anticipated that noise levels will increase 6 to 8 dBA, depending on the site. Noise levels at all residences will remain well below the 70 dBA allowed for this land use category.

Noise mitigation measures were considered for this project at the Sundance Campground and the Winnakee Campground where the noise impacts are the greatest. However, the Sundance Campground is presently closed and may not reopen, so mitigation measures are not warranted there. Also, the critical noise periods for campgrounds are during the evening hours when traffic is light and the noise impact would be much less than it is during the day. It should also be recognized that without access control, noise mitigation measures would be ineffective since a continuous noise barrier cannot be constructed, and vegetative screens are not effective noise barriers.[17] Due to these reasons, noise mitigation measures are not considered practical.

Local government officials have been provided with noise levels for various locations along the highway corridor for use in future planning efforts and land use decisions.

5. FLOOD PLAINS

Based on the analysis conducted for this report, no unavoidable adverse impacts to the flood plains of the study area are anticipated for any of the highway alternatives under consideration. The roadway elevations for any of the alternatives are above the high water elevations

recorded for the Flathead River along the corridor for the June, 1964 flood.[18] Approximately one-half mile south of Coram, the proposed highway alignment borders on the flood-prone area adjacent to the Flathead River. At this point a new highway would be located on a fill section, and the toe of the fill would extend slightly into the estimated Flathead River flood plain. Although the alternatives vary slightly in the amount of resulting intrusion, contingent on the width of the roadway section selected, proper alignment will minimize the extent of such encroachment. Thus no significant adverse consequences are anticipated and the limited intrusion into the flood plain of the Flathead River will have no discernible effect on floodwater elevations or hydraulic behavior of the flood plain during a flood event.[19]

Any highway alternative implemented would require engineering design for drainage according to current state and federal standards, assuring that adequate capacity would be provided at drainage crossings to prevent diking effects and backwater conditions. Thus no flood hazard areas would be created.

Any of the alternative highway designs would involve a crossing of Abbot Creek and the associated floodway, as well as several other intermittent drainages. Abbot Creek in particular, due to its size and flooding characteristics, would be the most important crossing from a drainage design standpoint. The design of the hydraulic structure at this location will include appropriate allowances to assure that excessive flooding at this location would not occur. Since a structure has been in place at this location for some time, the evaluation of the hydraulic requirements of any new structure would be relatively straightforward.

Since the flood plain intrusion is so minor and occurs at only one location along the project, there is little risk of impacting the natural and beneficial flood plain values if this project is implemented. This project will not encourage or support any development within the flood plain. Specific measures that have been taken include narrowing the roadway section as much as possible commensurate with meeting traffic demands, and shifting the alignment as far away from the river as practical. During design, special design considerations such as bin walls will be considered to limit and possibly eliminate any flood plain intrusion. These measures, combined with the management policies of the U.S. Forest Service for this section of the Wild and Scenic River System, will preserve the flood plain values. Other alternatives that were considered, such as realignment, would either increase encroachment into the flood plain or cause the highway to pass through presently undisturbed areas, creating greater adverse impacts on the natural environment.

On the basis of these investigations, impacts on flood plains are not considered significant with any of the alternatives that are likely to be constructed.

C. BIOLOGICAL ENVIRONMENT

This section discusses the impacts of the project on the biological environment. In addition to the information contained herein, a Biological Assessment was prepared for this project. The FHWA requested

formal consultation with the U.S. Fish and Wildlife Service as provided for under the Endangered Species Act. The Biological Opinion issued by the Fish and Wildlife Service as a result of this request concurred with the conclusions of the Biological Assessment. The Biological Opinion is reproduced in Appendix B of this report.

1. VEGETATION

Most of the proposed highway construction utilizes the existing right-of-way, and much of the additional right-of-way needed for straightening curves and widening the highway has already been acquired. Nearly all of this right-of-way occurs in dense, even-aged stands of lodgepole pine which are the result of severe fires that took place in the late 1920's and early 1930's.[20] Approximately four miles of this right-of-way has been cleared and is currently seeded to introduced grasses and clover (Trifolium spp.). Most of the cleared right-of-way is in the Flathead National Forest.

The only practical vegetation production possible for the lands along the proposed highway is timber production. Under current management practices, the productivity of the area is extremely low due to the dense, overstocked and stagnant stands of lodgepole pine. Due to the proximity of Glacier National Park, there are no plans at present to increase timber production capability on Flathead National Forest lands.[21] On privately owned lands, it would be possible to increase the productivity of the land by clearing the lodgepole pine and establishing a crop such as hay. The potential timber production is quite high if current management practices were altered to emphasize timber production.

At certain times of the year, some animals overcome their fear of roads and traffic because of a strong attraction to vegetation growing on roadsides.[22] Ungulates and bears are particularly attracted in the spring. Green-up occurs earliest in openings and on south- and west-facing slopes, which may include road berms. Based on this fact, it is particularly important that the new vegetative types planted on the side and back slopes of all new construction areas adjacent to the proposed highway be unpalatable species so that the attraction to wildlife is minimized. Some species of low palatability that would be recommended for planting along the Hungry Horse - West Glacier highway include: shrubs - Sitka alder, kinnikinnick, paper birch, oceanspray, juniper, mountain lover, ninebark, shrubby cinquefoil, red raspberry, Canada buffalo berry, spirea, and snowberry; grasses - streambank wheatgrass, redtop, pinegrass, and red fescue; forbs - yarrow, pussytoes, ox-eye daisy, hairy golden aster, wild strawberry, Gaillardia, and sticky geranium.[23] The precise combination of vegetation to be planted would be done as part of the final design process and would be reviewed with biologists from the National Park Service, Forest Service, and Montana Department of Fish, Wildlife and Parks.

In the areas where right-of-way has been cleared, the narrower two-lane alternatives occupy less of the right-of-way and would require more revegetation than the wider four-lane alternatives. In uncleared

areas, the area to be revegetated would be approximately equal for all construction alternatives.

Although there are slight differences between alternatives, these differences are considered minor in view of the total vegetation of the area. The differences in impact between alternatives is therefore considered negligible.

2. WILDLIFE

a. Fish

Although the proposed highway construction runs parallel to the Middle Fork of the Flathead River, the alignment is not immediately adjacent to the river. The distance between the highway and the river is sufficient that, if proper care is taken, the fish in the Flathead River will not be affected by the construction. Abbot Creek is the only perennial stream affected by the proposed construction. The highway crosses Abbot Creek approximately one-third mile above its confluence with the Flathead River. In the past there was a log blockage downstream of the highway crossing that created a waterfall and effectively prohibited the movement of spawning fish coming up from the Flathead River and only brook trout spawned in this stream.[24] Recently this barrier washed away, and now cutthroat and rainbow trout are making spawning runs up Abbot Creek. Although there is no traditional bull trout spawning run in this stream, this species may use Abbot Creek in the future.

Potential adverse effects from highway construction include siltation, which could cause suffocation of eggs and young fish in redds.[24] Severe siltation could affect aquatic insect populations and fish downstream of the construction. The proposed construction is sufficiently removed from Lake West, Lake Five and Halfmoon Lake that there should be no direct impacts on the fishes in these lakes. Although there would be some difference in quantities of earthwork between alternatives, construction methods would be approximately the same, and the differences between alternatives are considered negligible.

b. Amphibians & Reptiles

There are nine species of amphibians and five reptile species in the area of the proposed construction.[25,26] It is anticipated that impacts on these animals would occur primarily in the moist areas, at stream crossings and especially near marshes, during the summer months. The primary direct impact on these animals will be road fatalities. This loss may be related to the width of the road, since the wider the road, the greater the time and distance of exposure to traffic. It is anticipated, however, that since a highway has existed in the corridor for the past 50 years, these direct impacts should not be much greater than the current conditions. In regard to indirect impacts, the most significant will be the changes in habitat. In one case, filling of a small wetland

area will decrease habitat while in another area, moving the highway away from the wetland will result in less disturbance. These indirect impacts will have less impact on reptiles than on amphibians because reptiles have less specific habitat requirements.

There are some differences between the alternatives due to the differences in highway width with the wider alternatives filling in more of the wetland area. However, the area of wetlands to be filled is small, and the loss of habitat and the impact on amphibians and reptiles is not considered to be major for any of the alternatives.

c. Birds (Including Threatened Bald Eagle)

Many species of birds occur in the area of the proposed construction, either as migrants, nesting birds or residents. The major direct impact on birds will be fatalities from collisions with vehicles. In the case of flying birds, numbers of collisions may increase if higher traffic speeds are attained, since both birds and drivers will have less time for evasive maneuvers. Ground-dwelling birds such as grouse will be affected by the width of the road in much the same manner as amphibians and reptiles, and more fatalities can be expected with a wider road. Crows, ravens, hawks and eagles are attracted to road-killed carrion. If more carrion is produced, it is expected that more of these birds will be attracted and will be potentially vulnerable to being hit. It should be noted, however, that the potential for these road kills may decline as road widths increase due to the potential increased maneuverability for drivers to avoid collisions with birds feeding at the road side. Other species of birds may be attracted to gravel, salt or vegetation on the road berm, but this impact should not be any greater than on the existing highway.

There are two species of birds that occur in this area that are on the endangered species list.[27] The peregrine falcon is only rarely seen and does not nest in the area. There should be no significant impact on this species because it is in the area so infrequently.

The bald eagle is on the endangered species list in the state of Montana, and occurs in the area of the proposed construction as a migrant. Although there are at least nine active bald eagle nests in the Flathead National Forest, none are in the immediate vicinity of the highway.[28] Approximately 1,000 individual bald eagles pass through this area each fall and stop to feed on the spawning run of kokanee salmon, primarily along McDonald Creek approximately one mile northwest of West Glacier.[29] A record daily count of 618 eagles was made on November 29, 1978. A potential disaster could severely reduce the already endangered population when so many animals are concentrated in an area. Eagles also pass through this area during the northward migration in March and April but without the salmon food source to hold them, they do not stop over and concentrations of eagles do not occur.[30] Occasional bald eagles winter in the area, but it is not a winter concentration area.

In spite of the numbers of eagles that occur seasonally in this area, significant impacts are not anticipated for the following reasons:

1. This section of highway is sufficiently far from the river that it should not have much effect on eagles using this stretch of the river.
2. This section of river is not a primary area of concentration of bald eagles because of the current level of human disturbance to eagles from fishermen and others.
3. There already exists a highway on nearly the same alignment as the proposed improvement, for which the eagles have made behavioral adjustments.

A potential direct impact on bald eagles would be the possibility of being struck by vehicles while feeding on roadside carrion. The probability of this occurring is low because these birds are easily disturbed at feeding sites and would not likely be attracted to roadside kills.[28]

The biological assessment prepared for this project provides additional information on eagles in the area, and concludes that impacts on eagles would be negligible. The Fish and Wildlife Service has concurred that there will be no adverse impact on eagles as a result of this project (see Appendix B - Biological Opinion).

d. Mammals (Including Threatened Grizzly Bear)

There is considerable literature available on the impacts of roads on mammals. Not surprisingly, McClure (1951) found that animals (including man) suffer higher mortality with high traffic volume and speed.[31] Therefore, this subject is addressed in the following narrative.

1) SMALL MAMMALS

In a study on the effect of roads on small mammals, Oxley found that small forest animals like mice, squirrels and chipmunks were reluctant to venture onto roads where the distance between forest margins was greater than 20 meters.[32] For the most part, only the larger small mammals such as marmots, porcupines and raccoons crossed wider roads. He also found that road mortality for these animals increased with more extensive road improvements, and was highest when traffic density was high and young animals were emerging. This source suggests that a wide divided highway may be as effective a barrier to the dispersal of small forest mammals as a body of fresh water twice as wide. They express concern about potential fragmentation of large gene pools, especially where roads are constructed through parks or game preserves.[32] It is not believed that fragmentation of gene pools for small mammals is a significant impact; however, the evidence of potential adverse biological impacts resulting from wide roadway construction is very strong for most species of animals.

2) CARNIVORES

Concern has been expressed for some of the less common species of carnivores that occur in the area. Marten and wolverine both occur in the area of the proposed project.[33] In June, 1976 a radio-collared wolverine crossed the highway corridor.[34] Although scientific studies on the subject could not be found, conferences with other biologists lead to the probable conclusion that the wider the highway, the more severe the impact on these predators.[28,30,35,36,37,38]

The animal for which the greatest concern has been expressed relative to the highway construction is the grizzly bear. Grizzlies are the focus of considerable attention in this area for several reasons. First, the grizzly is considered a threatened species in the conterminous 48 states. Second, because of the proximity to Glacier National Park, bears are present in high concentrations and are attracted to areas outside of the park at certain times of the year by food sources and natural movement patterns. Particularly in the fall, and to a lesser extent in the spring, there are numerous grizzly bears in the West Glacier area.[39] Although grizzly and black bears are occasionally struck by cars, it is an uncommon occurrence.

There is concern that a wide highway would create a barrier to the movements of bears, and that secondary development associated with highway construction would have adverse effects on grizzlies. There is no literature to document the frequency of bears crossing wide versus narrow highways. Biologists agree, however, that many wild animals, especially those accustomed to seeking refuge from disturbance in forest cover, are reluctant to cross large openings such as a wide highway. However, Dr. C. Jonkel (Border Grizzly Project) has radio tracking data on two young grizzlies which repeatedly crossed Highway 93.[35] Although this is a heavily used highway, no observations of these bears were reported by motorists.

In regard to the project corridor, a highway already exists and the trees have already been removed from the northern half of the alignment to the width necessary to construct a wide four-lane highway. Bears have made behavioral adjustments to these conditions, and no bear mortalities have been reported.[40,41] Impacts can be minimized by keeping the width of the construction as narrow as practical and reestablishing vegetative escape cover, particularly in areas where wildlife is most likely to cross the road.

During testimony at the Draft EIS public hearing held for this project, Dr. C. Jonkel emphasized the importance of this area for grizzly bears crossing from major habitat areas on both sides of the highway. According to Dr. Jonkel, the crossing area is limited by the funnelling effect of Hungry Horse Reservoir on one side and Lake McDonald on the other, and that due to extensive development that has already occurred in the area, there are only about two to three miles along the corridor that are suitable for grizzly bears to cross. Dr. Jonkel also expressed concern over the lack of available data on bears in the area, and felt that decisions should not be made without proper studies on wildlife. He estimated that it would take a three- to five-year study to develop the proper information.

It is agreed that additional information on grizzly bears in the area would be desirable. However, research on grizzly bears crossing highways has failed to turn up any situation which would be directly applicable to evaluating the alternatives proposed for this project. Even if detailed studies on grizzly bear crossings in the area were done (as suggested by Dr. Jonkel), they would take from three to five years to complete and would yield only additional information on where grizzly bears tended to cross the existing highway. The study would not provide any information on the inhibiting factors that wider pavement areas would have on grizzlies that want to cross the highway, and the study

would therefore have limited value in the evaluation of the proposed alternatives.

It is acknowledged that incomplete scientific information is available to make a positive evaluation of the impacts on grizzly bears. The best assessment that can be made on the basis of expert opinion is that the wider the highway, the more reluctant a grizzly bear would be to cross it. It is not expected that any of the proposed alternatives would totally prohibit bear crossings. The remaining alternatives would likely inhibit bear crossings to the degree relative to the width of the highway, but would prohibit few if any of the bears from crossing the highway. Since this situation is so specialized, it is doubtful that appropriate information could be obtained regardless of the studies done.

Most of the bear crossings are expected in the less developed Coram - West Glacier section. In this area, due to the rolling terrain, the special design two lane frequently has climbing and/or turning lanes so that the paved width is frequently approximately 50 feet and occasionally 61 feet as compared to 64 feet for the preferred alignment. Thus the difference in width between these alternatives is not great.

Concern has also been expressed over the impacts of secondary development and the possibility of bear mortalities due to collisions with automobiles. As discussed in the section on socio-economics, secondary development is not expected to vary significantly between alternatives, and therefore would not constitute a basis of comparison relative to the impact on bears. Bears are very rarely struck by vehicles, and therefore this would not be considered a significant impact.

The U.S. Fish and Wildlife Service has expressed a preference for a two-lane highway keeping the highway section as narrow as possible between Coram and West Glacier to facilitate wildlife movement.

The biological assessment prepared for this project contains additional information on grizzly bears. The U.S. Fish and Wildlife Service in their biological opinion concludes that any of the most feasible alternatives would not likely jeopardize the continued existence of the grizzly bear (see Appendix B - Biological Opinion).

The wolf is another animal on the endangered species list that may occur close to the area of the proposed construction. Occasional wolves have been seen several miles to the north, and it is possible that a wolf might travel through the study area.[27] However, due to the rarity of occurrence and the improbability of a wolf remaining in such a highly developed area, it is anticipated that there will be negliglble effects on wolves from the proposed highway improvement.

3) UNGULATES

Four primary species of ungulates occur in the area of the proposed highway construction: white-tailed deer, mule deer, elk, and moose. Moose and mule deer occur relatively infrequently, but white-tailed deer and elk are more common. There is a herd of approximately 25 to 50 elk that frequents the project corridor. However, more than 100 elk were seen in the spring of 1981 in an alfalfa field planted in a clearing below the Glacier View Motel.[41] Although there have been no research projects on animal movements in this area, elk and deer are observed on the air strip and golf course at West Glacier, and in the newly cleared highway alignment (which has been planted with highly

palatable clovers and grasses) in the spring.[28,30] It is probable that the area located immediately south of West Glacier is a crossing for animals coming from the Desert Mountain winter range (see Figure 9, Part III).

The primary concern for these species in regard to the proposed project is the potential impact from car/animal accidents and road kills. Although wildlife sign is evident along the existing highway, deer, elk and moose kills are relatively rare. Mr. Gary Wagner, Section Foreman for the Highway Department in Kalispell, reported six road kills along this ten-mile section of road in the past six years.[40] Mr. Dave Weedum, State Game Warden for Region 1, estimates that approximately 12 animals are killed each year along this section of highway, with the majority of the kills being white-tailed deer.[41] Mr. Weedum further estimates that on the average there is one elk killed per year on this ten-mile section of highway, and that most of the road kills and animal crossings occur between Coram and West Glacier.

Considerable literature exists on the subject of the effect of roads and highways on deer and elk.[42,43,44] The consensus is that these species generally avoid roads, especially wider highways.

For this study, the highway corridor was traversed on foot to identify game trails. Although there are minor game trails near the corridor, there are no crossing areas that biologists consider to have sufficient use to justify the construction of underpasses or fencing for wildlife. This is further confirmed by the fact that neither Mr. Weedum, Mr. Wagner, nor any local residents reported specific places where road kills are concentrated.

A narrow highway, with shrub cover re-established to within 15 feet of the highway, would facilitate crossing by ungulates. A wide highway could be detrimental from the standpoint of inhibiting natural movement patterns. There is insufficient evidence to draw a conclusion on whether narrow highways with less exposure time are safer for ungulates crossing than wider highways that have greater exposure but where vehicles have more room to maneuver (assuming the same traffic volumes on both facilities). It could therefore be expected that fewer animals would cross a wider highway than a narrower one, but there would probably not be appreciable differences in mortality rates.

Because of the relatively low numbers of elk, their seasonal occurrence, and the fact that mortality rates on the present highway are low, no significant impact on elk is expected. Moose and mule deer occur infrequently in the area and the highway alternatives are not expected to have an influence on them. White-tailed deer are more numerous and constitute most of the road kills along the existing highway. The increased highway width will provide more room to maneuver, and mortality rates are not expected to increase significantly.

3. WETLANDS

a. Impacts

As described in Part III - Affected Environment and shown on Figure 9, the proposed alignment will cross two areas that have been identified as wetlands. One of these areas is an intermittent stream with ad-

jacent wetlands and the other is a marshy area that extends on both sides of the highway.

The intermittent stream with adjacent wetlands is located approximately one mile north of Coram. There is a transverse crossing of this stream by the proposed alignment approximately 600 feet to the west of where the existing highway now crosses the stream. Construction of the highway at this location will require filling an area of about 100 feet by 200 feet for the 88-foot alternative. At the crossing location, the wetland is narrow and not very productive for wildlife habitat. It is noted that the most productive wetland area is a pond just east of the existing highway. The proposed alignment shifts the highway away from this area, and will reduce the disturbance and make the pond more desirable to wildlife.

The transverse crossing of the intermittent stream with wetlands must occur somewhere along the stream. (Unless, of course, the highway is built only on divides, which is obviously impractical.) The location of the proposed crossing is in an area where the wetlands are narrow and moves the highway away from the most productive wildlife habitat area. Consideration was given to obliterating the existing highway; however, it is needed to service local traffic and it was not practical to remove. Consideration was also given to relocating the highway to miss the wetlands. However, much of the right-of-way for the proposed alignment has been purchased, and realignment would require purchasing additional right-of-way. In addition, the crossing of the intermittent stream would have to occur at some location, which would result in equal (or in some cases greater) impact on these wetlands.

The marshy area is located midway between Coram and West Glacier near the Blankenship Road turnoff. The wetland that would be affected is an area of about one acre on the east side of the highway, and is part of adjoining larger wetland areas that extend to both sides of the highway. The proposed alignment is the same as that of the existing highway at this location. Construction of the widest alternative (88-foot highway) would result in filling a wetland area of approximately 110 by 150 feet. Since the wetland area that would be affected is immediately adjacent to the existing highway and has been cleared for the proposed highway, it provides minimal cover for wildlife.

The crossing of the marshy area is proposed to be accomplished using the existing highway alignment, including the existing roadway fill. Consideration was given to realigning the highway to miss the wetland area. However, as can be noted on Figure 9, larger wetland areas occur on both sides of the highway and realignment could not occur without requiring construction through presently undisturbed areas. The proposed crossing occurs at a narrow part of the wetlands, fully utilizes existing construction, and therefore will have the least impact on adjacent wetland areas.

b. Wetlands Findings

In accordance with Executive Order 11990, "Protection of Wetlands" (42 FR 26961), alternatives to avoid impacts on wetlands were investigated. The wetlands that will be affected by this project are not con-

sidered to be important wildlife habitat or pollution abatement areas. The impacts that are expected to occur will not significantly affect the characteristics of wetlands in the area, particularly in view of the small area that would be affected. Practical alternatives that are available to avoid the wetlands, such as realignment of the highway, would result in greater adverse impact on the natural environment.

Measures to be taken to minimize harm to existing wetlands include locating the alignment to have minimum impact, maintaining culverts and other drainage facilities at proper elevations to avoid draining existing wetland areas, and maintaining and planting vegetative screens to minimize disturbance to wildlife utilizing adjacent wetlands.

Based on the above considerations, it has been determined that there is no practical alternative to the proposed new construction in wetlands, and that the proposed action includes all practical measures to minimize harm to wetlands which may result from such use.

D. HUMAN ENVIRONMENT

1. SOCIO-ECONOMICS

With an understanding of the existing social and economic conditions in the Hungry Horse - West Glacier area, an evaluation was made of the potential impacts resulting from each of the five roadway alternatives. These potential impacts were based on existing research and studies as well as resident and business surveys conducted along the project corridor. Included herein is a summary of the possible impacts for the various roadway alternatives evaluated.

In the interpretation of the socio-economic impacts, it should be recognized that social and economic impacts are difficult to quantify, and, since they are subjective, tend to reflect the opinion of the person doing the analysis. Also, where numbers are shown in this section, they should be considered as approximate and the result of mathematical calculations rather than exact values.

a. Population

Research indicates that once highway improvements relieve most of the traffic congestion, additional population will move into the area simply because area amenities will then be more easily accessible with less hazardous conditions on the road.[45] Therefore, the methodology used for this project included an allowance for increased base population in conjunction with improvements to the road, up to the point where a significant amount of congestion was relieved.

Based on the analysis completed for the project, it is anticipated that the population in the South Fork Census District will increase from the current population of 2,000 to 2,440 persons in the year 2000 if no improvements are made to the existing highway. This represents an increase of 22 persons per year for the next 20-year period. It is also anticipated that the distribution of the new corridor population will be

concentrated in the Hungry Horse and West Glacier areas more than elsewhere. This projection is based on Flathead County projections made in 1981 for the Flathead River Basin Environmental Impact Study. The judgment was made that corridor gain would be directly proportional to countywide increases.

It is anticipated that the population of the area will increase to 2,832 people by the year 2000 if a new 44-foot-wide two-lane highway is constructed. Projection methodology was based on the assumption that as transportation improvements are made, some increase in population will occur due to the easier and less hazardous movement to and from home and job. This assumption was confirmed through personal interviews in the area and at other locations where parallels could be drawn. Specifically, the projections resulted from taking a regression analysis of 1970-1980 population estimates and factoring percentage results upward by a 50 percent judgment for the improved road. It is expected that this new population will be concentrated in the Hungry Horse and West Glacier areas. However, the new highway may, to some degree, act as a magnet and future population growth may tend to locate closer to the improved highway.[46]

In regard to the remaining three roadway alternatives (special design two-lane, 60-foot-wide four-lane, and 88-foot-wide four-lane), it is estimated that the population for the Census District will increase at approximately the same rate, regardless of which of these alternatives were constructed. The primary reason for this similarity in population increase is the determination that any of the three alternatives would relieve much of the traffic congestion along the corridor, and thus any improvement beyond the special-design two-lane roadway will not directly encourage further population growth. It is forecast that the population in the area for these three roadway alternatives in the year 2000 will be 3,050, which represents an additional 610 persons residing in the area in the year 2000 when compared to the no-build alternative. The projection methodology in these cases was again based on a regression of population estimates from 1970 to 1980 and then judgementally increasing the percentage results by a 75 percent allowance for the road improvement. It should be noted that although it is anticipated that the population increases for the next 20-year period are projected to be higher for the special-design two-lane and both four-lane alternatives when compared to the no-build and the 44-foot two-lane alternative, the differences in these projections are quite small when compared to the overall population in the area. For example, the difference in population growth between these various roadway alternatives is less than ten people per year.[47]

These differences in population growth estimates are not significant except for the no-build alternative, which would result in significantly less population growth in the corridor.

b. Housing

In the South Fork Census Division, the base number of housing units is 1,400. Again, a forecast to the year 2000 was made for each

highway improvement alternative in order to compare total housing growth resulting from each alternative.

Basically, it is expected that the housing growth rates will correspond quite closely to the trends previously discussed for the anticipated population forecasts. It is anticipated that the number of households will increase by 203 units by the year 2000 if no roadway improvements are made. If a new two-lane highway (44 feet wide) is constructed, it is anticipated that the housing units will increase by an additional 213 units by the year 2000 when compared to the no-build alternative. Furthermore, it is anticipated that an additional 322 units will be constructed by the year 2000 when compared to the no-build alternative for the remaining three roadway alternatives (special-design two-lane, narrow four-lane, and 88-foot four-lane). Housing projections were based on a factor of 1.5 to 2.0 persons per household.[48]

For all of the five roadway alternatives, the distribution of these additional housing units is expected to be somewhat more concentrated in the West Glacier area. Growth will be attracted there because of the golf course, tourist business, and related Glacier National Park emphasis. The community of Hungry Horse should also attract a substantial number of these housing units. Coram and Martin City will pick up some housing units, and there will be a scattering of development in the rural areas that are easily accessible to Highway #2. Also, most development will occur in areas already in residential land use.

A review of the projected housing unit increases for the proposed five roadway alternatives indicates that even if the housing units rise to the maximum forecast, the changes in the environment will not be noticeably significant, especially if spread out over a 20-year time frame. It should also be noted that the most dramatic housing changes related to any road improvements have already occurred. Most of the right-of-way necessary for any of the alternatives has been purchased and most of the relocation has been completed. This socio-economic cost has been substantial, but is already effected and irreversible.

c. Relocation Impacts

Most of the right-of-way acquisition and relocation has already taken place as part of the original project that was halted by the courts. This acquisition and relocation was done in accordance with state and federal law and involved the displacement of 33 households and 12 businesses. There are two residences and two businesses that remain to be relocated. One parcel accounts for both a residence and a business. Replacement housing has been made available and an "in-lieu-of" settlement will likely be provided for the business. The other residence is a mobile home, for which sites in the area are available. The remaining business is a grocery store which will probably also be settled by an "in-lieu-of" settlement.

Since the right-of-way purchased was for the 88-foot alternative, sufficient right-of-way for any of the alternatives will be available.

d. Land Use

As a result of the investigations made for this project, it can be determined that the impact on the land use along the project corridor will be relatively minor for any of the five roadway alternatives under consideration. The largest change in the land use pattern resulting from any of the alternatives, with the exception of the no-build alternative, will be the use of the new alignment that has been designated. This impact, however, will be minimized from usual levels since most of the right-of-way has already been purchased for the new alignment and most initial necessary relocations have been made.

For all alternatives, some additional but not substantial landscape will need to be changed, in addition to the cutting and clearing. Specifically, some residences and a few businesses will require new access to the realigned highway. Some new businesses will be attracted where private land now exists alongside the realignment of the road. Certainly there will be new signing necessary for existing and future businesses. The Martin City business and commercial district now located adjacent to and within easy sight of the highway will be more removed from the new road. As a result, some minor change in commercial atmosphere and land use in the Martin City area might be expected.

The maximum population increase over expected growth due to the influence of the proposed project is an additional 610 people, requiring an additional 322 units. As discussed in the section on housing, these units are expected to concentrate in the developed communities of West Glacier, Hungry Horse, Coram, and Martin City, with some rural development scattered along the corridor. The development that occurs adjacent to the communities will have little impact on land use patterns, but the development in the rural areas will tend to lessen the undeveloped and natural character of the area.

In regard to either the two-lane or four-lane alternatives, it is anticipated that the visual and aesthetic qualities within the communities will change to a small degree. The predominant land uses in the corridor, however, would remain the same as present uses for either the two-lane or four-lane alternatives. The four communities would likely have the same basic character for all alternatives, and the recreational atmosphere and forested scenic vistas would continue to be a key to the character of the traveled route. The businesses that would be along the route and those that would be attracted to the route in the future would be service- and tourist-oriented. Such commercial development alongside a four-lane highway would consume some additional, presently undeveloped land as compared to the two-lane or no-build alternatives. For the four-lane alternatives, there would be an additional expanse of pavement. This expanse would tend to separate business and residential areas that were located on opposite sides of the highway as it goes through the communities. This differing land use impact between the two-lane and four-lane alternatives should not be substantial.

e. Community Structure

The estimation of impacts to community services for each of these alternatives was based on the forecast of population increase, employment increase, and housing increase resulting from each of the alternative actions. Interviews with community leaders up and down the corridor and with Flathead County officials were used to further evaluate the probable impacts to public services in the area.

It is expected that under the no-build or two-lane (44 feet wide) alternatives, the relatively small growth in the area's population and employment will not cause any dramatic changes in the infrastructure of the corridor communities. The public services, school facilities, transportation patterns, fire protection, health services, law enforcement and public and private utilities will continue to be maintained at basically the current level.

For the special-design two-lane and both of the four-lane alternatives, it is anticipated that some infrastructural changes will occur by the year 2000. Like the housing and population trends previously discussed, it is anticipated that the impact on the infrastructure will largely be the same for any of these three roadway alternatives. It is feasible that actions will be taken by the year 2000 under any of these three alternatives to incorporate one or more of the unincorporated areas, because with more population, an increasing demand for public services will be felt.

Although there will be an increase in school enrollment, most of the increase in grade school students will likely be absorbed in existing schools since current enrollment in the grade schools in the corridor is substantially below capacity. An additional 114 grade school students could be accommodated with no new construction required. If the current student/population ratio holds, the existing grade schools could handle the expected growth. Junior high and high school students in the corridor area attend schools in Columbia Falls. These schools are at capacity, and additional growth in Columbia Falls and/or the project corridor could require the construction of additional facilities. Table No. 18 shows the school capacity and enrollment for the schools that would be affected.[49]

Streets and roads in the concentrated community areas will also begin to need additional attention. Fire protection may become an issue, and law enforcement personnel will be more frequently called upon to deal with circumstances in this area. As the population base expands by more than 1,000 in the corridor, water and sewage problems will also amplify. These problems will not be overwhelming compared to current conditions, but this population base may be just enough of an addition to make treatment plants and community water systems more feasible in the more populated communities.

f. Economy

The base gross sales in the corridor area are currently estimated at 5.5 million dollars annually.[50] To compare what the economy might be like under each of the improvement alternatives, an estimate in 1981 dollars was made of the gross sales of businesses located in this corridor area to the year 2000. This forecast was based upon an increased population base in the year 2000, plus the assumption that a continuation of moderate growth in tourism will occur.

Based on the impacts previously discussed for the population, housing and community structure, the economy of the area is not expected to significantly change from current conditions under the no-build alternative. The growth in the economy, however, is expected to increase for all the other four roadway alternatives, with the expected additional growth in sales volume for the corridor businesses resulting from the improved two-lane (44-foot width) to be an increase of approximately $1 million annually by the year 2000 when compared to the no-build alternative. It is further estimated that the the area's economy will increase by approximately $1.25 million annually by the year 2000 when compared to the no-build alternative for the special-design two-lane and both of the four-lane alternatives.

TABLE NO. 18

SCHOOL ENROLLMENTS AND CAPACITIES

AREA SCHOOLS	1981 ENROLLMENT	PRESENT CAPACITY	RESERVE CAPACITY
Grade Schools:			
Hungry Horse	83	100+	17+
Martin City	51	80-100	24-49
Coram	40	80	40
West Glacier	32	60	28
Grade School Total	206	320+	114+
Columbia Falls Jr. High	386	370	-
Columbia Falls High School	754	600	-

Source: Personal and Telephone Conversations with Respective School Personnel, September, 1981.

g. Summary of Socio-Economic Evaluation

The conclusion of the research team that did the social and economic assessment of this Environmental Impact Statement is that socio-economic conditions are expected to remain relatively static under the no-build alternative. A minor increase in socio-economic activity is expected to occur if the 44-foot two-lane were constructed. Moderate growth in socio-economic activity is anticipated for the special-design two-lane and both of the four-lane alternatives.

Although some changes in the socio-economic scene are expected to occur, it should be noted that the changes are in comparison to a small socio-economic base. The overall socio-economic climate of the area is not expected to change significantly from current conditions.

2. TRANSPORTATION

Rail and air transportation facilities provide access from distant areas to the recreational and commercial attractions in the area. Perpetuation of existing U.S. #2 conditions, as would occur with the no-build alternative, would have minimal impact on ridership trends for both air and rail travel. Recent trends are in an upward direction for both of these transportation modes, which would be largely unaffected by the highway.

For the 44-foot-wide two-lane alternative, alignment and grade improvements would be constructed along the route. Consequently, somewhat better traffic safety and an increase in capacity would result. Slightly higher traffic volumes resulting from a minor increase in local population (see the Population section of this chapter) and a continuation of tourism increases will occur. The trends for highway traffic volumes and capacities by alternative are shown in the analysis of traffic impact.

Considering the remaining roadway alternatives (i.e., the special two-lane, and both of the four-lanes), the same type of impacts to the transportation system would occur. The major difference lies in the creation of safer and higher capacity conditions as the roadway width increases. In all cases, local roadway approach conditions would be improved and only minor increases in local traffic would result from upgrading the highway.

Several important recreation area access roads leading to the perimeter of the corridor would receive some additional vehicular pressure after the highway improvement. The primary access points are at Hungry Horse Dam Road, Spotted Bear Road, and several points in the proximity of Lake Five (including the loop roads leading to Blankenship Bridge). Turning movement counts taken in May and July of 1981 show that an average of ten percent of the existing highway traffic has an origin or destination somewhere along the Hungry Horse Dam or Spotted Bear roads. Existing maximum volume along these roads at the highway intersection is approximately 50 vehicles per hour (VPH). This is indicative of the existing level of use of the area's recreational roads, and

shows that increased usage resulting from highway improvements would not increase traffic volumes over the capacity limits.

As in the case of the no-build alternative, the effect on local air and rail transportation facilities would be relatively insignificant.

3. TRAFFIC

The measure by which a particular highway is fulfilling its function of carrying traffic is determined by a capacity analysis and by establishing the level of service at which the highway is operating. The capacity of a highway is defined as "the maximum number of vehicles per unit of time that can be handled by a particular roadway component under the prevailing conditions". This description and the analysis procedures used are from the Highway Capacity Manual.[51]

To function satisfactorily, a roadway must operate at a lower volume of traffic than when the facility is at capacity. The maximum number of vehicles that can be carried at any particular level of service is known as the Service Volume. Levels of service are designated from A through F (with A being the best and F the worst) to cover the full range of traffic operating conditions. These levels of service are described as follows: [51]

Level of Service A

A free-flow condition with low volumes and high speeds. There are little or no restrictions to traffic and few delays.

Level of Service B

Stable flow with operating speeds beginning to show some restriction. Reductions in speeds may occur with a low probability of traffic flow being restricted.

Level of Service C

Still in the zone of stable flow with speeds and maneuverability more closely controlled by the higher volumes. Most drivers are restricted in their freedom to select their own speed, change lanes, or pass.

Level of Service D

Approaching unstable flow with tolerable operating speeds, although considerably affected by changes in operating conditions. Drivers have little freedom to maneuver and comfort and convenience are low.

Level of Service E

Represents operations at even lower speeds than Level D, with volumes at or near the capacity of the highway. Flows are unstable and there may be stoppages of momentary duration.

Level of Service F

Forced flow operation at low speeds where volumes are below capacity. Speeds are reduced substantially and stoppages may occur for short or long periods of time because of the downstream congestion.

In the evaluation of the highway alternatives for the Hungry Horse - West Glacier project, service volumes for each type of highway in both the developed and rural areas were calculated using the procedures in the Highway Capacity Manual. It should be noted in the interpretation of this data that the computation of highway capacities is not an exact science, and the resulting information should be used as a guide and not as an absolute limit.

Table No. 19 represents the service level at which each highway alternative would operate at both existing and estimated future traffic volumes. The service levels for each community and the rural sections between each community are as shown. The detailed calculations including service volumes are on file at the Montana Department of Highways in Helena.

TABLE NO. 19

LEVELS OF SERVICE FOR ROADWAY ALTERNATIVES

EXISTING (1981)		HUNGRY HORSE	RURAL	MARTIN CITY	RURAL	CORAM	RURAL	WEST GLACIER
30th High. Hrly. Vol.		707	637	637	579	579	511	511
88' 4-Lane		A	B*	A	B*	A	B*	A
60' 4-Lane		A	B*	A	B*	A	B*	A
Sp. Des. 2-Lane		A	C	A	C	A	C	A
44' 2-Lane		A	C	A	C	A	D	A
No-Build		A	E	A	E	A	E	A
FUTURE (2003)								
Des. Hrly. Vol.	(min.)	1,060	950	950	790	790	780	780
	(max.)	1,200	1,080	1,080	900	900	890	890
88' 4-Lane	(min.)	A	B*	A	B*	A	B*	A
	(max.)	A	B*	A	B*	A	B*	A
60' 4-Lane	(min.)	A	B*	A	B*	A	B*	A
	(max.)	A	B*	A	B*	A	B*	A
Sp. Des. 2-Lane	(min.)	A	D	A	C	A	C	A
	(max.)	A	D	A	D	A	C	A
44' 2-Lane	(min.)	A	E	A	D	A	E	A
	(max.)	A	E	A	D	A	E	A
No-Build	(min.)	A	F	A	F	A	E	C/A**
	(max.)	A	F	A	F	A	F	D/C**

* Maximum level of service for 60 mph speed

** Eastbound approach/westbound approach

It can be noted from this table that the existing highway in the rural areas is operating at Service Level E, which is at or near the capacity of the highway. Increased future traffic would result in a Level of Service F, which would be unstable flow.

The service level in the developed areas is shown as Service Level A for all alternatives except for the intersection at West Glacier for the existing two-lane highway. This is partially due to the analysis procedures which are generally intended for larger urban areas. In addition, lower speeds and less distance between vehicles are more acceptable in developed areas, which is reflected in the capacity analysis procedures.

Both four-lane alternatives operate at Service Level B in the rural areas. The level of service is restricted to no higher than Service Level B because this is the highest service level that can be attained with a 60 mph speed, according to the Highway Capacity Manual.

The special design two-lane alternative would operate at Service Level D. The limitation in capacity to Service Level D is due to the two-lane sections of highway that do not include climbing lanes. The climbing lanes would operate at Service Level C, but the accepted procedures for highway capacity analysis state that the service level is established by the limiting sections. To raise the special design two-lane to a Service Level C, most (approximately 70 to 80 percent) of the highway would have to have climbing or turning lanes.

The 44-foot two-lane alternative would operate at Service Level E between Hungry Horse and Martin City, Service Level D between Martin City and Coram, and Service Level E between Coram and West Glacier.

The existing two-lane highway would operate at Service Level F for the entire length except for the low design hourly volume estimate for the section between Coram and West Glacier, which would operate at Service Level E.

The determination of the level of service for which a particular facility is to be designed is normally based on the level of congestion that is acceptable and the resources available to construct the facility. In the case of the Hungry Horse - West Glacier project, natural environmental impacts are also an important consideration.

The Montana Department of Highways typically designs for Service Level B in rural areas and Service Level C in urban areas.[52] This procedure is consistent with the recommendations contained in the report, A Policy on Geometrical Design of Highways and Streets (NCHRP Project 20-7, Task 14 Review Draft #2A). However, this report also indicates that a service level less than these recommended levels may be appropriate for certain recreation routes.

In summary, either of the four-lane alternatives would result in a high level of traffic service throughout the life of the project. The two-lane special-design highway would operate at an adequate level of service at current traffic volumes, but would result in some traffic congestion in the summertime as traffic increases. The two-lane alternative and the no-build alternative would result in substantial congestion and reduced travel speeds during the summer months, with conditions growing progressively worse as traffic increases.

4. TRAFFIC SAFETY

a. Accident Rates in Montana

An investigation into the accident rates occurring on various types of highways in Montana was undertaken to establish the relative safety of each of the alternatives. The Montana Department of Highways maintains an accident record file as part of the Highway Information System (HIS) program, and can retrieve accident data for specific sections of highways throughout Montana.

The categories of highways investigated included: two-lane highways with adequate shoulders, two-lane highways with climbing lanes, narrow four-lane highways, and wide four-lane highways. The accident history on the existing highway was used for the no-build alternative. When identifying various highways in Montana that would represent the conditions of the project corridor, highway sections that had characteristics of traffic, terrain, and location similar to that of the Hungry Horse project were chosen. Table No. 20 contains a summary of the accident rates for the various highways in Montana that are similar to the five highway alternatives.

In the interpretation of the data in Table No. 20, the following points should be kept in mind:

* There are not many non-interstate four-lane highways in Montana, and the accident records are not extensive
* The four-lane highways tend to be newer highways in better condition
* The only wide four-lane highways available for comparison are partially access-controlled.

In addition, new four-lane highways that replace a two-lane highway show an artificially low rate that tends to increase as time passes. In view of this information, the accident rates for the four-lane highways may be understated.[53]

The specific sections of highways that were used to develop these accident rates and the corresponding calculations are on file at the Montana Department of Highways office in Helena.

TABLE NO. 20

ACCIDENT RATES BY TYPE OF HIGHWAY IN MONTANA

TYPE OF HIGHWAY	LENGTH OF SAMPLE	ACCIDENT RATE (MILLION VEHICLE MILES)
Hungry Horse - West Glacier Highway	11.367	3.65
Two-Lane with Shoulders	29.897	2.01
Two-Lane with Climbing Lanes	17.522	2.48
Narrow Four-Lane	8.677	2.19
Wide Four-Lane	15.150	1.06

In addition to this analysis, the accident rates by type of Federal Aid Highway in Montana are shown in Table No. 21.[54]

TABLE NO. 21

MONTANA ACCIDENT RATE SUMMARY

TYPE OF HIGHWAY	ACCIDENT RATE (MVM)
Interstate	1.35
Primary	2.43
Secondary	2.92

The interstate system is primarily representative of four-lane access-controlled highways, and the majority of the primary and secondary highways are two-lane roadways.

b. Accident Rates in Other Areas

Information on accident rates by type of highway in other areas is limited. The classic study in this area is entitled Accidents on Main Rural Highways[55] published by the U.S. Department of Transportation, Federal Highway Administration. The weaknesses of using this study for the Hungry Horse - West Glacier project are that: 1) the study was done in 1964, and the composition of traffic (in particular, the increase in small cars) has changed since then; and 2) the four-lane highways that were used in the study had medians of varying widths. However, the information is presented in Table No. 22 for comparison purposes.

In addition to the comparison of two-lane versus four-lane highways, the effect of lane width and shoulder width on highways was investigated. The literature on this subject is somewhat inconsistent,[56] but some conclusions can be drawn. It is generally accepted that accident rates decrease as the pavement lane width increases up to an 11-foot lane and then remains fairly constant. It is also accepted that roadways with paved shoulders have lower accident rates than roadways with unpaved shoulders.

Recent findings tend to support a reduction in accidents if a shoulder is available. As near as can be interpreted from the data available, five- to six-foot shoulders are the most cost-effective.

TABLE NO. 22

NATIONWIDE ACCIDENT RATES[55]

HIGHWAY TYPE	DAY	NIGHT	TOTAL*
Two-Lane Main Rural Highways	2.49	4.64	3.01
Four-Lane Main Rural Highways	1.58	3.74	2.11

* Weighted averages using day and night travel figures

c. Estimated Accident Rates for Alternatives

On the basis of this information, the accident rate for each of the proposed alternatives was estimated using the best judgment of the traffic engineers conducting this analysis. These accident rate estimates are shown in Table No. 23.

TABLE NO. 23

ESTIMATED ACCIDENT RATES BY ALTERNATIVE

ALTERNATIVE NO.	ESTIMATED ACC. RATE/MVM	EST. AVG. NO. OF ACC./YR.
1. 88-Foot Four-Lane	1.4	21
2. 60-Foot Four-Lane	2.2	34
3. Two-Lane Special Design	2.2	34
4. 44-foot Two-Lane	2.0	31
5. Existing Highway	3.7	59

Based on this information, all of the build alternatives would be much safer than the existing highway.

d. Pedestrian Safety

A substantial amount of research was conducted to determine the relative safety of two-lane versus four-lane highways in an attempt to evaluate the pedestrian safety aspects of the alternatives. Unfortunately, most of the research on pedestrian accidents has concentrated on pedestrian accident characteristics with most studies completed for urban areas. No applicable study that directly addressed the relative safety of rural two-lane versus four-lane highways was identified from the analysis conducted for this study.

Studies on pedestrian accidents show that most of these accidents involve either the young or the old. This is borne out by the pedestrian and bicyclist accidents that occurred along the Hungry Horse - West Glacier highway from 1976 to 1980 when five of the ten pedestrian and bicyclist accidents occurring involved the young and two involved the old. This situation most likely occurs because the young are not properly trained, controlled or alert enough to avoid traffic, and the old have impaired senses which make them less able to perceive a dangerous situation.

The difficulty in evaluating the pedestrian accidents for the two-lane and four-lane alternatives are two-fold: 1) there is not enough accident experience in Montana to develop a valid comparison between the alternatives; and 2) pedestrian accident causes are usually site- and situation-specific, and it is difficult to transfer experience in other situations (such as an urban location) to the conditions at the Hungry Horse - West Glacier project.

Since research on comparable studies was not available, the approach used to evaluate pedestrian accidents was to discuss the situation with individuals who are experienced and knowledgeable in pedestrian accident research. These individuals include Dr. Alfred Farina, Office of Driver and Pedestrian Research, National Highway Traffic Safety Administration, Washington D.C., and John Fagen, Office of Research, Federal Highway Administration, Washington D.C. Both of these individuals were contacted in August, 1981.

Dr. Farina's opinion is that, although not substantiated by research, the specific characteristics of the site and the pedestrian crossings would affect the pedestrian accidents more than the difference in the widths of two-lane and four-lane alternatives. The four-lane roadway would provide more pedestrian "gap" opportunities, but requires a longer distance to cross. To avoid trapping pedestrians in the travelled way, a pedestrian island should be provided. The two-lane highway has a lesser distance to cross, but would provide fewer "gap" opportunities, particularly at higher traffic volumes. As near as Dr. Farina could estimate, the relative pedestrian safety of the two-lane versus four-lane alternatives would be approximately equal.

John Fagen states that, to his knowledge, there are no studies available that would provide a comparison of two-lane versus four-lane highways with regard to pedestrian safety. His opinion is that there is insufficient evidence to compare pedestrian safety on two-lane and four-lane highways, and that no conclusions can be drawn that would justify a difference in pedestrian accident potential between two- and four-lane, rural highways. He consulted with Mr. Dick Knoblaugh of Biotechnology, Inc., who is also knowledgeable on pedestrian accident research and who concurred with Mr. Fagen's opinion.

The preferred alternative does not have a pedestrian island since the area that would have been used for such an island was used for on-street parking. Although pedestrian islands are desirable, this is not as major a factor in pedestrian accidents as the type of pedestrian crossings that are provided and the use of a proper education program. Therefore, the lack of a pedestrian island for the preferred alternative will not materially affect pedestrian safety.[57]

On the basis of the investigations that were undertaken and the experts who were interviewed, the accident potential appears to be more a function of pedestrian facility design than of the number of lanes. There is no evidence that any particular alternative would provide better pedestrian safety benefits than the other alternatives, provided that proper pedestrian facilities are provided. The conclusion of this section is therefore that there is no identifiable difference in pedestrian safety between the alternatives.

For all of the alternatives, separate pedestrian/bicycle facilities (including sidewalks in developed areas and a bicycle path) will be provided. This separation of pedestrian/bicycle traffic from vehicular traffic should substantially improve the safety characteristics of the highway for pedestrians and bicyclists.

e. South Fork Bridge

The analysis of the South Fork Bridge indicates that 19 of the 22 accidents occurred either on the bridge or at the west approach, and that 14 of the 22 accidents involved winter conditions when traffic is lowest. These conditions would not change with any of the proposed alternatives.

In the approach to the bridge from Hungry Horse, it is intended that any transition would begin at the edge of Hungry Horse with guardrail and signing for the bridge approach. In the case of the four-lane alternatives, the outside lane would terminate at one of the last intersections in Hungry Horse (Fifth Street West or Sixth Street West), and the approach to the bridge would be the same as for a two-lane highway. There are indications that the improved delineation at the bridge has already reduced accidents. Additional delineation will be provided at the east approach to the bridge to channel drivers onto the bridge. Under these circumstances, the safety conditions at the South Fork Bridge would not be significantly different than they are at the present.

E. CULTURAL, RECREATIONAL AND VISUAL ENVIRONMENT

1. ARCHAEOLOGICAL AND HISTORICAL

Cultural resource surveys conducted for the project indicate that two sites of historic significance are located in West Glacier. The sites include the Belton Chalets, a property on the National Register of Historic Places, and the Belton Railway Depot, a property recently determined to be eligible for inclusion in the National Register. Evaluations of the potential impacts on both historic sites due to the construction of the project led to the conclusion that neither site will be affected. "Determination of No Effect" statements were prepared for each historic property by the Montana Historical Society, Historic Preservation Office.[58,59] Documents regarding the "No Effect Determination" for each site are on file with the FHWA office in Helena.

No other archaeological or historical resources were identified that would be affected by the project. In the event that properties of significance are discovered during construction, the Montana Department of Highways Standard Specifications for Road and Bridge Construction provides that "When any contractor's operation encounters remains of prehistoric people's dwelling sites or artifacts of historical or archaeological significance, the operation will be temporarily discontinued until notified by the Engineer to resume work. The Engineer will contact archaeological authorities to determine the disposition thereof." This provision should provide adequate protection to the archaeological and historical resources of the area, and no impact from the proposed project is expected.

2. RECREATIONAL

The no-improvement alternative would result in a continuation of the existing level of service to recreational areas. Roadway width, alignment, pavement section, and signing would remain unchanged, continuing the hazardous conditions at accesses to recreation sites.

The build alternatives would all provide improved access to recreation areas. For all alternatives, recreation area access roads would be well marked and approaches would be improved to provide better and safer access. Since the higher capacity highways would be less congested, the four-lane alternatives would provide better access than the two-lane alternatives. Improved access will probably result in slightly increased use of all of the recreation facilities along the corridor.

The 88-foot four-lane would require taking property from the roadside parks in Hungry Horse. This would result in a less desirable roadside park, and less use of these areas. None of the other alternatives would require taking park area. This impact is discussed in detail in Part V, "Section 4(f) Evaluation".

No other significant impacts to the recreational resources of the area are anticipated.

3. VISUAL

Visual quality is one of the most complex factors to analyze because its perception is dependent upon personal viewpoint. The views of the new highway from existing residential and commercial development, from the surrounding area, from floaters and anglers on the river and from the road users themselves, as well as their visual experience of the area as seen from the highway, are all relative points to consider in arriving at an overall impact evaluation.

The primary visual resources impacted in the area are the vegetative backgrounds and screens which provide visual relief from development and some changes in elevation which provide different viewpoints for scenic transitions. Careful revegetation and terracing techniques can retain these essential resources throughout all undeveloped areas of the route.

At the location between Martin City and Coram where the river and highway are close together, the construction fill would encroach onto the flood plain. This encroachment would be greatest for the 88-foot four-lane alternative and progressively smaller for any of the other alternatives. Minor realignment would be required to reduce the impact for all alternatives.

For the 60-foot four-lane, the area of the exposed fill would be approximately 700 feet long by 80 feet high. The special-design two-lane would reduce the length of the fill by approximately 10 percent and the 44-foot two-lane would reduce the length of fill by about 20 percent. In all cases the fill height would remain approximately the same. For all alternatives except the 88-foot four-lane, a strip of timber about 200 feet wide would screen the fill from the river.

Because of the dense vegetation, elevation difference, and the distance between the highway and river, no adverse affect should be noted by either river users or from other viewpoints distant from the project.

Initial steps toward protecting the visual resources of the area have already been undertaken. In 1971, the Department of Highways developed a landscaping and scenic enhancement plan recognizing this highway as an approach to Glacier National Park. Scenic enhancement easements as shown in Figure 27 have been purchased along many portions of the existing highway corridor. These scenic enhancement areas include the preservation of existing vegetative screens, and the restriction of development immediately adjacent to the highway. In addition to these scenic enhancement areas, utilities have either been moved to a utility corridor outside of the view from the highway or buried wherever practical.

With these protective measures taken, the visual image of the highway corridor should be enhanced and protected.

F. ENVIRONMENTALLY SENSITIVE AREAS

1. GLACIER NATIONAL PARK

The impacts to Glacier National Park from this project are primarily due to the following factors: 1) this highway is the principal approach route to Glacier National Park and affects the attitude toward and quality of the park experience; 2) development that occurs adjacent to or near the Park affects the transition into the Park environment.

The U.S. Department of Interior has voiced concern over the potential of creating a "tunnel effect" if a highway of even width throughout its length were constructed. Although this might be the case if the highway were a tangent section, the variation in curvature, grade and topography would create a variety of visual experiences. In addition, as suggested by the Department of Interior, the vegetation line will be varied to create wildlife cover and to provide sunlight in appropriate icy areas as well as varying the visual effect. With these options, none of the proposed alternatives would create a "tunnel" effect.

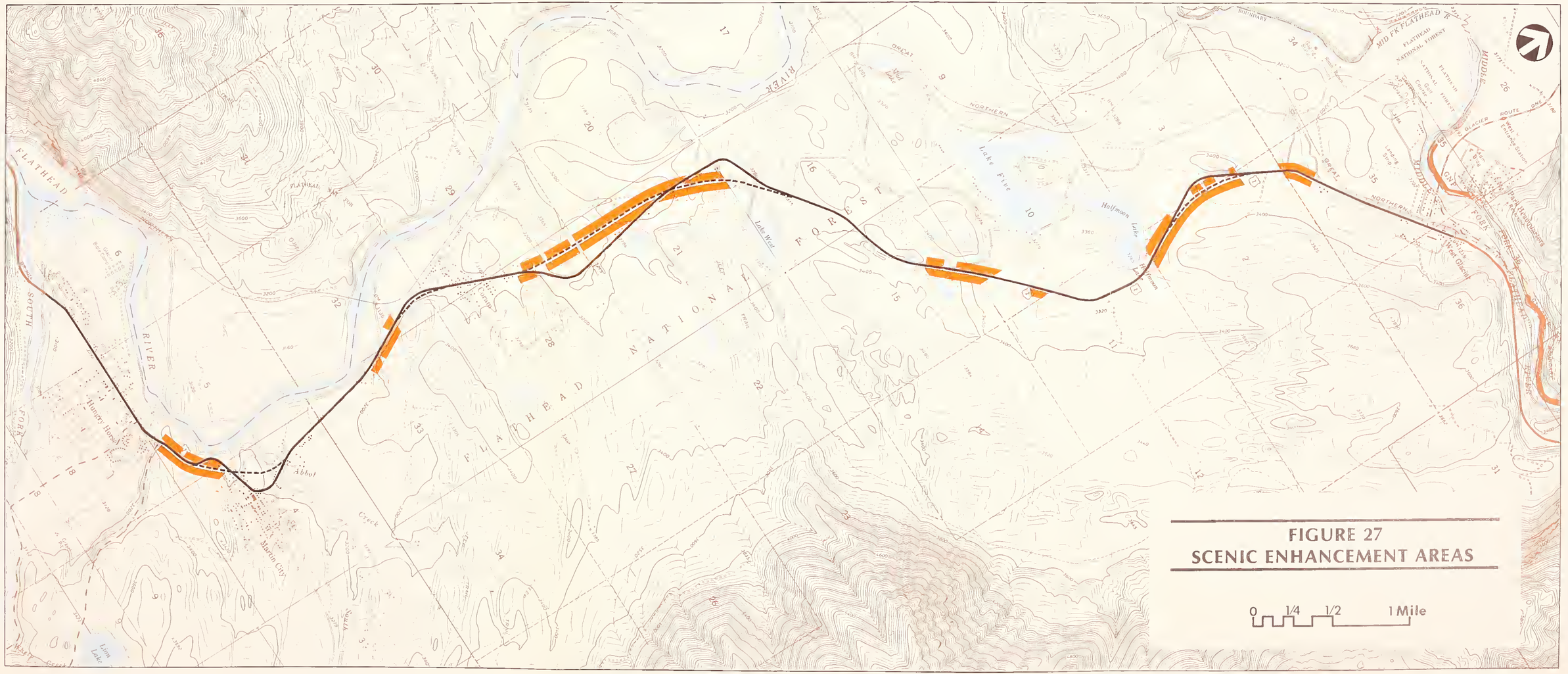


FIGURE 27
SCENIC ENHANCEMENT AREAS

0 1/4 1/2 1 Mile

The visual impact of a highway is directly related to the width of the highway. The wider the pavement, the more obvious it is and the more visual impact it has. In the comparison of alternatives, the narrowest highway that could fulfill the traffic and safety functions of the highway with adequate driver comfort and convenience would create the least impact and provide the most desirable approach route to the Park.

A major problem cited by the Department of Interior is the potential for secondary development with associated activities that could have a cumulative adverse impact on the Park. However, the estimates of population increase for the build alternatives from the 44-foot two lane to the 88-foot four lane differ by less than ten percent per year. After researching literature on the subject, it is the judgment of the Economist associated with this project that the potential for development is not dependent upon the number of lanes but rather upon the degree to which traffic congestion is relieved. To inhibit secondary development, it would be necessary to continue the traffic congestion that is now occurring.

There is not sufficient difference between the build alternatives with regard to secondary development to justify the selection of one alternative over another. The primary problem is that there is a substantial amount of private property available for development (as shown in Figure 11) , and there are no land use controls at present which limit the development in the area. In fact, the Park's policy of of reducing accommodations within the Park may well increase the need for these facilities adjacent to the Park and have a much greater impact on secondary development than any of the proposed highway alternatives.

The private land near Glacier Park has value due to its proximity to the Park. The options for limiting secondary development include: 1) prohibiting access to the highway; 2) purchasing the land (or development rights); and 3) enacting land use controls that would limit or prohibit development. The first two options have been partially implemented by the Highway Department through the purchase of scenic enhancement easements and property which include preserving existing vegetative screens and restricting development adjacent to the highway (see Figure 27). A limited access highway facility was considered, but was determined not desirable since virtually all of the right-of-way has been acquired without access control. The second option of purchasing additional land or development rights was not considered practical or appropriate for the highway project, but could be an option for other governmental agencies. The last option of enacting land use controls to limit secondary development is a local prerogative and not within the jurisdiction of the sponsoring agencies of this EIS. For any of the options where the development of the land is directly restricted by the Department of Highways, compensation to the landowner would be necessary, as required by law.

It is recognized that the "general scene" influences the impressions and value of Glacier National Park. Serious consideration has been given to the options that are available to limit the secondary impacts and enhance the approach corridor to the Park. Increased consideration has been given to the two-lane special design alternative as opposed to the preferred narrow four-lane alternative, as requested by the U.S. Department of the Interior.

It is believed that none of the build alternatives would increase secondary development or change the present trends of the area to any significant degree when compared to the other build alternatives. In addition (with the possible exception of the 88-foot four lane), any of the highway alternatives could be properly designed to provide an aesthetically pleasing approach to the Park.

2. WILDERNESSES

The potential impacts on wildernesses are similar to the impacts on Glacier National Park (of which 92 percent is presently managed as a wilderness). These impacts include secondary development and the potential for overuse of particular areas which may cause damage to the natural environment.

Improved access to the area will contribute to these problems. The no-build alternative would have the least impact, since traffic congestion would tend to discourage visitors. The improved access from any of the build alternatives may tend to encourage a few additional visitations and slight increased use. There would likely be no discernible differences in impact between any of the build alternatives.

3. WILD & SCENIC RIVERS

The Middle Fork of the Flathead River near the project is part of the Wild and Scenic River System and has been classified as a Recreational River. The administering agency for this section of river is the U.S. Forest Service, which is a cooperating agency for this project. The Wild and Scenic River Study Report prepared by the Flathead National Forest was used to identify management policies for this section of river.

The Middle Fork of the Flathead River will be impacted by: 1) a sliver fill that will encroach onto the flood plain between Martin City and Coram; 2) discharges into the river from storm drainage detention ponds; and 3) increased runoff from the greater area of pavement due to reconstructing the existing highway to a wider section.

As discussed in the previous section on visual impacts, the exposed fill would be approximately 700 feet long by 80 feet high for the 60-foot alternative. The length would be reduced by about ten percent for the two-lane special design and 20 percent for the 44-foot two lane with the height remaining about the same for all alternatives. Consideration was given to shifting the alignment away from the river into the hill. However, the hill at this location is steep, and shifting the highway into the hill will result in a large cut scar on the hillside that would have an equal visual impact. As viewed from the river, the fill would be screened by a stand of timber about 200 feet wide, and will have minimal impact on the scenic qualities of the river. The fill will be planted with appropriate vegetation so that the long-term appearance of the slope would blend with the existing natural area.

The drainage discharges into the Flathead River from the storm drainage detention ponds will be designed to blend into the natural

channel of the Flathead River. Natural drainage channels will be used where possible with slope stabilization utilizing native materials for bank protection.

As discussed under the section on water quality, pollutants are primarily related to the traffic volumes on the highway. The additional volume of runoff generated from wider pavement will increase the potential for pollution, including increased turbidity, to reach the Flathead River. However, runoff in this area is not high due to the type of vegetative cover. The possibility of pollutant contamination is low, as shown in Table 15.

It is the conclusion of this section that none of the proposed highway alternatives will have a significant impact on the visual resources or water quality of the Wild and Scenic River system.

4. BAD ROCK CANYON

Badrock Canyon is a natural constriction of the Flathead River through which pass U.S. Highway 2 (a two-lane highway), a power line, and a railroad. Although the canyon is used as a transportation and utility corridor, it has been identified as having significance to the bald eagles during periods of migration.[60]

The values of the canyon include that of a scenic attraction, an area of local historical significance, and a park and rest area located in the canyon, as well as its use by bald eagles.

The Department of Highways does not have any plans to improve Badrock Canyon at the present time. If improvements are proposed for the canyon, the impacts to eagles and other environmental considerations will be addressed. Since the Hungry Horse - West Glacier highway is one mile away from Badrock Canyon, there is no direct impact on the canyon from this project. It is expected that traffic increases will occur along this section of U.S. 2 regardless of the alternative selected, and that future traffic growth is relatively independent of the improvements proposed for the Hungry Horse - West Glacier highway.

5. CORAM EXPERIMENTAL FOREST

The project will not encroach upon the Coram Experimental Forest, will not affect any of the Forest Service's management policies for the area, and therefore will not impact the Forest.

G. ENERGY EVALUATION

Energy requirements for the various alternatives described in this study were analyzed to determine the effect each alternative would have on energy requirements. Transportation facilities result in the direct consumption of energy by vehicle use and in indirect consumption by construction and maintenance activities both for the roadway and for the vehicles using the roadway.[61]

The methodology used for analyzing the energy use was taken from the handbook Energy Requirements for Transportation Systems, prepared by J. A. Apostolos for a FHWA workshop in 1979.[61]

The unit of energy used in the calculations and comparisons was the British Thermal Unit (BTU), which is the quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit at or near 39.2° F and standard pressure. Comparisons were also made on the basis of equivalent barrels of oil per day for each alternative.

Comparison of energy consumption between alternatives indicates that there would be little if any difference in energy consumption (see Table No. 24). The greatest difference is between the no-build alternative and the 88-foot-wide four-lane alternative, and amounts to approximately a ten percent difference in energy consumption. Generally, a difference of ten percent or less is not considered significant; therefore, the small difference between alternatives indicates that all the alternatives are essentially equal with respect to energy consumption.

TABLE NO. 24

ENERGY CONSUMPTION BY SOURCE
EQUIVALENT ANNUAL CONSUMPTION IN BTUx10^{10}

Description	88' 4-Lane	60' 4-Lane	Sp. Des. 2-Lane	44' 2-Lane	Pref. Alt.	No Build
Direct: Vehicle Fuels	10.90	10.90	10.30	9.41	10.90	9.80
Indirect: Vehicles	8.40	8.40	8.40	8.40	8.40	8.40
Indirect: Construction	1.16	0.96	0.88	0.80	0.96	0
Indirect: Maintenance	0.53	0.42	0.37	0.31	0.42	0.58
Total Energy BTU (Annual Avg.)	21.0	20.7	19.9	18.9	20.7	18.8
Equiv. Barrels of Oil per Day	99	98	94	89	99	89

H. CONSTRUCTION IMPACTS

Since the construction activities would involve extensive excavation and earthwork, those potential impacts associated with the construction phase of each project merit special consideration. The nature of the impacts will be different from those of a completed highway.

Due to the nature of highway construction, disruption of existing resources and ecological systems can occur. Thus the resource categories previously identified have been reviewed again from this standpoint. Since highway construction techniques are relatively standardized, past construction projects of similar natures have been used as a basis for projecting roadbuilding activities and their potential resulting impacts.

A detailed discussion of those impacts is summarized herein.

1. PHYSICAL ENVIRONMENT

a. Geology and Soils

Generally, the most direct physical alteration of geologic structures would take place during the construction phase. The result of such construction activity would be the displacement, redistribution and structural alteration of existing soil and rock materials. Prior to excavation, topsoil would be stripped and stockpiled. At the conclusion of construction, this topsoil will be replaced on disturbed areas and vegetation planted in all areas except for rock cuts.

Due to the size of the proposed project, a source of aggregate would be necessary in the area for crushed base course and bituminous plant mix for the highway surface. The aggregate sources available locally appear suitable for such use, and crushing and processing of these materials on the corridor is likely. The consequences of such an operation to the geologic environment of the area would be limited. The volume of material, while significant, would not deplete any known bedrock or alluvial gravel resources. The siting of such a crushing facility would be of concern from the standpoint of avoiding a variety of potential impacts to water quality, vegetation and wildlife, air quality, etc. This should be a design consideration in any alternative selected involving new roadway construction. The Montana Department of Highways specifications governing these operations and the Montana Open Pit Mining regulations would assure that these operations would not cause any significant adverse impacts to the area.

As a result of these protective measures, no lasting adverse impact to the geology and soils of the area is expected.

b. Water Resources and Quality

1) SURFACE WATER RESOURCES

The major threat to surface water quality due to the construction

phase of a new highway project along the corridor would be the potential for sediment picked up by runoff from the construction site polluting watercourses. Such pollution involves primarily native soil particles and dissolved minerals. Suspended solids, typically clay particles, would be the major concern; of secondary interest would be soluble salts and minerals.

It is obvious that the larger the area disturbed by the highway construction, the greater the potential for pollution. Likewise, deeper excavation could expose less resistant soil and rock strata, promoting runoff contamination. From these standpoints, the no-build alternative is the most favorable in that no new construction, and thus no removal of existing vegetation or topsoil, would occur. The other alternatives would become progressively less favorable with increasing roadway widths and resultingly larger areas of disturbance.

The potential for surface water impacts from the construction involved with the four alternatives involving highway replacement will be effectively mitigated by proper construction practices. The Montana Department of Highways Standard Specifications for Road and Bridge Construction contains provisions to protect water quality during construction. Selected provisions of these specifications are reproduced in Table No. 25,[62] and will be incorporated into the contract documents to assure minimal impact from erosion and sedimentation. Temporary erosion control utilizing silt fences, sediment basins, seeding and mulching are specific measures that will be included in the contract documents.

TABLE NO. 25

STANDARD EROSION CONTROL PRACTICES

1. The Contractor shall submit to the Engineer for approval a program for effective control of water pollution.
2. The Contractor shall meet the requirements of the applicable regulations of the Department of Fish, Wildlife, and Parks, Department of Health and Environmental Sciences, and all other state or federal regulations relating to the prevention or abatement of erosion, water pollution, and siltation.
3. Throughout construction, the Contractor shall exercise every reasonable precaution to prevent pollution and siltation of rivers, streams, or impoundments.
4. In case of failure on the part of the Contractor to control erosion and water pollution, the Engineer reserves the right to take whatever action is necessary to provide the proper corrective measures.

2) GROUNDWATER RESOURCES

The only opportunity for adverse impacts to groundwater quality due to highway construction would involve the percolation of contaminated surface waters into the groundwater. This differs from the situations described previously in that the contaminants contained in such construction site runoff would not typically include the heavy metal fractions or traffic-related contributions. Rather, the pollutant load would primarily involve native materials that were transported by the runoff. The characteristics of the area would indicate that the primary contaminant thus contained in the runoff would be suspended sediment and dissolved minerals. The sediment fraction would effectively be removed by physical filtration as the water percolates through the soil and no measurable impacts are expected for any of the alternatives.

c. Air Quality

Construction activity is expected to have a temporary air quality impact on the study area environment with any of the four highway alternatives involving new construction. Particulate emissions would be generated from clearing and burning of slash, excavation, movement of soil, hauling of materials, wind erosion on exposed surfaces, aggregate crushing plants, and hot mix asphalt plants. The magnitude of such emissions would be directly related to the construction activity, and could be expected to be comparatively greater with the construction of the wider roadway sections.[63]

Gaseous emissions would be generated primarily from large gasoline and diesel engines on construction vehicles and equipment. Again, the amounts of such emissions would be related to the size of roadway being constructed due to the amount of service that would be required of such engines.[63]

Precautions to be taken to minimize adverse impacts would include use of water to keep down dust on temporary construction haul roads, vehicle speed restrictions, and seeding and mulching of exposed areas as quickly as possible.[63] Compliance with all appropriate federal and state air quality regulations as well as standard specifications and practices of the Montana Department of Highways relating to air quality would be required and enforced. Of particular concern from an air quality compliance standpoint would be hot mix plants for asphalt production and open air burning of cleared timber and slash, if allowed.

d. Noise

Construction noise will come primarily from the gasoline or diesel engines on highway construction equipment. Primary areas of impact will be Hungry Horse and Coram. Martin City and West Glacier will receive some impact, but most of their areas that are noise sensitive are located away from the proposed project route. A few isolated motels and campgrounds will also receive impact from construction noise.

Construction noise would also be generated by stationary equipment and by impact equipment such as air hammers or air-operated

drills. Noise from construction sources can be minimized with the use of mufflers, silencers, and enclosures. These precautionary steps do not affect noise produced by the actual construction work. Optimal muffler systems can reduce engine noise up to 10 dBA, vibration dampening can reduce noise up to 5 dBA, shields such as sound skins may achieve reductions of 20 dBA at high frequencies and 10 dBA in the middle frequency range, and sound aprons may achieve noise reductions up to 10 dBA.[64] Proper maintenance and operation of equipment can also provide significant reductions in noise. In addition, scheduling of construction work to avoid night operations in developed areas can reduce the impact of construction noise.[64] With the use of such precautionary steps, no significant adverse noise impacts due to construction are anticipated with any alternative design.

e. Flood Plains

There is nothing unique about the construction activities that would affect the flood plains of the area, since construction within designated flood hazard areas would be limited to a localized area between the highway and the Flathead River between Martin City and Coram, and at the Abbot Creek crossing. Between Martin City and Coram, the toe of the fill for a new roadway would intrude slightly into the floodplain of the river, but equipment operation and construction activity in the flood plain would be very limited and of no significant consequence. A narrow flood hazard area would be crossed at the Abbot Creek crossing, but the use of an efficient hydraulic structure at the crossing would likely result in a beneficial impact by improving upstream drainage characteristics and possibly reducing the extent of the flood plain in this area. No adverse impact is anticipated.

The Department of Highways would be required to file a Hydraulic Notice with the Department of Fish, Wildlife and Parks for the crossing of Abbot Creek.[65] While more oriented toward fishery preservation, this notification process would provide an additional review of the impact the type of structure proposed would have on the drainage area. A Corps of Engineers Section 404 Permit for Flood Plains and Wetlands would also be required.

2. BIOLOGICAL ENVIRONMENT

a. Vegetation

Construction of a new roadway of any design would entail stripping of the vegetative cover from the work area prior to earthwork activities. Wider roadway sections would result in more extensive vegetation removal than narrower sections.

The removal of trees would be confined to those stretches where roadway widening or straightening of curves is required. Along part of the highway alignment, clearing has already been completed. Thus standing timber would only be slightly affected. The wider highway sections would of course have a greater effect. However, the stands of

such timber in the immediate vicinity are characterized as dense and relatively low in productivity under current management practices. Thus the harvesting of these trees would not be detrimental due to its restricted extent.

The existing highway corridor is planted with introduced grass cover which would largely be destroyed. After construction of a new roadway, new cover would be re-established. This new cover will be of low palatability to avoid attracting animals to the highway.

b. Wildlife

Construction-related consequences to the wildlife resources of the area are minor, regardless of the alternative selected for implementation. Wildlife in the immediate area of construction would be disturbed but since the area in which the construction would take place is not considered major wildlife habitat, the adverse impacts would not be significant.

The well-being of the fishery resources of the watercourses would be safeguarded by preserving the quality of the surface water resources. Protection is afforded by the required water quality standards that apply during the construction phase as well as input from the Department of Fish, Wildlife and Parks during the design and construction phases.

Conflicts with avian species should not occur during construction. The majority of vehicles involved with construction activity are operated at low speeds, thereby reducing the likelihood of collisions. Habitat destruction would be very limited, since the majority of the existing ground cover affected would be existing roadway grasses. Where harvesting of timber was necessary along the corridor, some possible disturbances could occur. However, the affected timber lies in generally close proximity to the existing highway and should be less preferred for nesting and roosting sites than the number of more remote sites available. Due to the ample unaffected habitat available, any induced relocation would be relatively inconsequential.

Mammals would be substantially unaffected by the construction activity. Their general mobility, coupled with their general preference for seclusion, would suggest that they could adapt to the short-term construction disturbance. As demonstrated at sites of logging and previous construction activity in the area such as near the Goat Lick site, indications are that adverse effects by construction activity would be limited.[66]

As a measure to minimize adverse consequences to wildlife due to any highway construction, contacts between workers on the site and wildlife should be discouraged. It should also be emphasized that foresight in the course of the construction activity to prevent spills or the availability of toxics for ingestion by wildlife species is warranted.

c. Wetlands

Portions of two wetland areas adjacent to the highway corridor will

be filled during construction. The impacts on these wetlands are discussed elsewhere in this report. During construction, disruption of these wetlands will occur as well as disturbance to nearby wetlands. The wetlands to be filled are not major habitat areas and the impact is expected to be minor. The impact on nearby wetlands is temporary, and the long-term impact will be negligible.

3. HUMAN ENVIRONMENT

a. Socio-Economics

Construction-related impacts to the socio-economic structure of the study area will be limited, and of temporary duration like the construction activity itself. The primary impact would be associated with the temporary influx of personnel necessary for the construction work. Although some local labor would likely be used, any of the four build alternatives would require importing workers into the area. The alternatives would vary somewhat in this regard, since the wider roadway designs are somewhat larger projects which in turn require more manpower. The projected temporary population increases due to construction labor requirements and the total number of construction-related employment positions generated are summarized for the various alternatives in Table No. 26.

Housing would be needed to accommodate this temporary population increase. While local accommodations including motels and cabins would be able to handle most of the needs, there is a possibility that temporary housing, or more likely sites for mobile homes or recreational vehicles, would be necessary.

Community structures and facilities along the existing corridor would most likely be unaffected by any construction activity. A slight impact to community services and utilities associated with the temporary influx of construction labor would result; however, the magnitude of the population increase would not be significant and the impact is expected to be minor.

The temporary population increase resulting from construction activities is estimated to be between 44 and 64 persons, depending upon the selected alternative.[67] The majority of this construction population is expected to reside in the Hungry Horse - Martin City area for approximately 18 months. Area grade schools are currently well below enrollment capacity and could easily handle the increase in students; however, junior high and high school facilities in Columbia Falls have been operating at or above enrollment capacities for several years. The increase in school-age children resulting from the influx of temporary construction workers should be small and area schools should be able to absorb the few additional students without difficulty.

Construction employment on a highway project can be expected to add an estimated $300,000 to $500,000 to the local economy of the area, primarily to gross sales of area businesses. The alternatives vary in this regard due to the size of the construction project involved, with the widest roadway design resulting in the greatest economic boost. The no-build alternative would not generate any such economic benefit. No

other significant economic impacts associated with the construction phase are anticipated.

TABLE NO. 26

PROJECTED CONSTRUCTION JOBS AND TEMPORARY POPULATION INCREASES DUE TO CONSTRUCTION ACTIVITY

ALTERNATIVE	CONSTRUCTION JOBS GENERATED	TEMPORARY POPULATION INCREASE
Alternative 1: 88-foot four-lane	75	64
Alternative 2: 60-foot four-lane	65	56
Alternative 3: Two-lane special design	60	52
Alternative 4: Widened Two-lane	50	44
Alternative 5: No-build	0	0

b. Transportation

The transportation resources and facilities of the study area would remain largely unaffected by the construction phase of any proposed project. No airfields exist in the area that would be affected. The Burlington Northern railway through the corridor canyon would be isolated from the site of construction activity and would not be crossed or otherwise affected. Passenger bus service through the corridor, like automobile and commercial truck traffic, would not be significantly interrupted but would be subject to the usual construction delays and possible detours.

c. Traffic Safety

As discussed in the preceding section, traffic along the existing highway would be slightly affected by construction of a new roadway. The anticipated delays and detours would require appropriate provisions for traffic safety in the construction zone. The Department of Highways in conjunction with the highway contractor would develop and exercise a traffic control plan in and around the construction site. It is likely that one-way routing would be necessary through localized construction zones, and minor delays would result. To accomplish such traffic adjustments, a combination of temporary signing and traffic signals, flag-

men, pilot cars, detours and/or mandatory speed reductions may be used.

The areas within the corridor communities and at major intersections require special consideration due to a greater complexity of traffic movements. The use of the existing corridor by bicyclists presents another aspect requiring special consideration for safety during construction. While bikers are handled like motorized vehicles from a traffic routing standpoint, their presence warrants consideration for passing through construction zones.

Pedestrian crossings and use of the right-of-way also merit special allowance in the design of a construction traffic safety program. Generally, pedestrian access through construction zones should pose no problem, and the OSHA-mandated warning devices on construction equipment provide a safeguard against pedestrian hazards.

4. CULTURAL, RECREATIONAL AND VISUAL ENVIRONMENT

a. Archaeological and Historical

Since no sites of archaeological or historical significance have been identified in the construction area, no adverse impacts will occur. If an unknown site or evidence thereof was discovered during the course of construction, provisions are included in the MDOH Standard Specifications for Road and Bridge Construction to prevent these artifacts from being destroyed. Specifically, these provisions state that when any contractor's operations encounters remains of prehistoric people's dwelling sites or artifacts of historical or archaeological significance, the operation will be discontinued until the Engineer gives notification to continue work.[68] The Engineer will contact archaeological authorities to determine the disposition of the artifacts.

Thus practical safeguards are provided for any unknown resources that might exist in the corridor, and no adverse impacts for any of the alternatives are anticipated.

b. Recreational

The recreational resources of the corridor area could be expected to suffer a minor temporary impact in terms of reduction of access during the construction phase. While law prohibits the denial of access to any residence or business, the highway construction process would reduce the ease of access to recreational attractions while work was taking place. This could serve as a deterrent to recreation in those areas, but the impact is anticipated to be slight.

c. Visual

An adverse impact to the visual resources of the study area by virtue of construction is implicit in all of the alternatives involving such activity. The primary visual resource of the area lies in its natural

scenic character. A certain amount of short-term unsightliness typical of major earthwork sites would result during construction. Due to the temporary nature of the construction and the revegetation provisions that would be required, the overall significance of this impact is not considered severe.

I. SUMMARY OF COSTS AND BENEFITS

1. CONSTRUCTION COST ESTIMATES

Construction costs were estimated for each of the alternatives. A set of plans and quantities were available for the 88-foot-wide four-lane highway from the original design. Estimates of quantities for the remaining alternatives were based on preliminary designs of each alternative. Unit bid prices from the Department of Highways bid tabulations were applied to the quantities to arrive at construction cost estimates. The detailed quantities, unit prices, and costs are on file and available for review at the Montana Department of Highways office in Helena.

Estimated construction costs for each alternative are given in Table No. 27.

TABLE NO. 27

ESTIMATED CONSTRUCTION COSTS

ALTERNATIVE	CONST. COST*	20% ENGR. & CONTIN.	TOTAL	ANNUAL COST**
1. 88-foot four-lane	$9,369,980	$1,873,996	$11,243,976	$1,320,713
2. 60-foot four-lane	7,836,669	1,567,334	9,404,003	1,104,590
3. Special two-lane	7,215,522	1,443,104	8,658,626	1,017,039
4. 44-foot two-lane	6,611,530	1,322,306	7,933,836	931,905
5. No-Build	N.A.	N.A.	N.A.	N.A.
6. Preferred Alternative	7,865,415	1,573,083	9,438,498	1,108,642

* Construction costs are based on 1981 dollars

** Based on 10 percent interest over a period of twenty years

2. MAINTENANCE COSTS

Annual maintenance costs for the different alternatives were estimated using historic maintenance costs from the Department of Highways maintenance records. These estimated costs are shown in Table No. 28. It should be noted that there was substantial variation in the maintenance costs for the sections of highways sampled, and engineering judgment was used to apply these cost figures to the alternatives. The basic information and methodology used to develop the annual maintenance costs is on file and available for review at the Department of Highways office in Helena.

TABLE NO. 28

ESTIMATED ANNUAL MAINTENANCE COSTS

ALTERNATIVE	ROAD MAINT. PER MILE	SNOW REMOV. PER MILE	MAINT. COST PER MILE	TOTAL COST PER YEAR	ANNUAL SAVINGS
1. 88-foot four-lane	$3,950	$2,000	$5,950	$65,034	$ 8,568
2. 60-foot four-lane	2,850	1,900	4,750	51,918	21,684
3. Special design two-lane	2,400	1,800	4,200	45,906	27,695
4. 44-foot two-lane	2,000	1,500	3,500	38,255	35,346
5. No-Build	5,175	1,300	6,475	73,601	----
6. Preferred Alternative	2,850	1,900	4,750	51,918	21,684

3. BENEFITS

The benefits that would be realized by road users from the improvements to the existing condition include: 1) travel savings due to a reduction in roadway length; 2) improved comfort and convenience; 3) an expected reduction in accidents; 4) time savings due to a shorter travel time; and 5) a reduction in maintenance costs. The logic and calculations for these estimated benefits are on file and available for review at the Department of Highways office in Helena. The benefits estimated for each alternative are shown in Table No. 29.

TABLE NO. 29

ESTIMATED ANNUAL BENEFITS

BENEFIT	88' 4-LANE	60' 4-LANE	SP. DES. 2-LANE	44' 2-LANE	PREF. ALT.	NO BUILD
Travel Savings	$168,250	$168,250	$168,250	$168,250	$168,250	N.A.
Comfort & Conven.	306,480	298,818	283,494	260,508	298,818	N.A.
Accident Reduction	338,175	228,781	228,781	256,085	228,781	N.A.
Time Savings	719,233	719,233	550,991	347,699	719,233	N.A.
Maint. Reduction	8,568	21,684	27,695	35,346	21,684	N.A.
Total Benefits:	$1,540,706	$1,436,766	$1,259,211	$1,067,888	$1,436,766	N.A.

4. BENEFIT COST ANALYSIS

Benefit/cost ratios were calculated using the estimated costs (annualized construction costs) and estimated benefits to provide an idea of the cost effectiveness of each alternative. It is emphasized that these are estimated costs and benefits, and that values have been placed on normally intangible benefits. The interpretation of these ratios should therefore be done with caution, and with the approximate nature of a benefit/cost analysis in mind. It should also be noted that small differences in benefit/cost ratios should not be considered significant due to the approximate nature of the benefit/cost analysis.

Table No. 30 shows the annual costs, benefits, and benefit/ cost ratio for each alternative.

TABLE NO. 30

ESTIMATED BENEFIT/COST RATIOS

ALTERNATIVE	ANNUAL COST	ANNUAL BENEFIT	BENEFIT/COST RATIO
1. 88-foot four-lane	$1,320,713	$1,540,706	1.17
2. 60-foot four-lane	1,104,590	1,436,766	1.30
3. Special two-lane	1,017,039	1,259,211	1.24
4. 44-foot two-lane	931,905	1,067,888	1.15
5. No-Build	N.A.	N.A.	1.00*
6. Pref. Alternative	1,108,642	1,436,766	1.30

* For the purposes of this analysis, the costs and benefits were compared to existing conditions, which results in a benefit/cost ratio of 1.00 for the no-build alternative.

J. SUMMARY OF ENVIRONMENTAL CONSEQUENCES

To aid in the evaluation of the highway alternatives, significant environmental consequences have been summarized for each alternative in Table No. 31.

A categorization of those impacts which are distinct for a particular alternative and which are common to all is presented in this table. This categorization highlights distinctive differences that exist among the alternatives, and suggests which impacts should be emphasized in the decision-making process.

Some classes of impacts are subjective and resist quantification. Likewise, a number of environmental consequences do not vary appreciably among the alternatives. These effects, including impacts to the physical environment, the biological environment, and the cultural-recreation-visual environment, are projected to have negligible differences between alternatives. Thus these consequences do not result in substantial distinction among the options. In the case of certain impacts, the degree of impact has been projected to be proportional to the width of the roadway involved.

A number of categories of potential impacts vary with the specific alternative involved. These include traffic and safety, energy, cost, and construction-related concerns. Again, some variations observed are directly related to the width of the road surface. The distinctions in these categories constitute a basis for comparison of alternatives.

TABLE NO. 31 - SUMMARY OF ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE

ALTERNATIVE	WATER	AIR & NOISE	FLOOD PLAINS	BIOLOGICAL ENVIRONMENT	SOCIO-ECONOMIC	TRAFFIC & SAFETY	CULTURAL, RECREATIONAL, VISUAL	PARKLAND	CONSTRUCTION	COSTS
ALTERNATIVE 1 — 88′ FOUR-LANE AN 88-FOOT-WIDE FOUR-LANE HIGHWAY CONSISTING OF TWO 12-FOOT TRAVEL LANES AND A 10-FOOT SHOULDER IN EACH DIRECTION WITH A 20-FOOT PAVED MEDIAN	Pollutant loads generated by any of the alternatives would be comparable and of such a minor nature that the potential impact to ground and surface water resources in the area would be negligible. Runoff from rainfall or snowmelt along the roadway would be comparatively greater for larger paved areas, and the wash-off of accumulated roadway pollutants would consequently be greater. Retention facilities are included for the proposed stormwater collection systems to be constructed in Hungry Horse, Coram and West Glacier under these alternatives.	Adverse air quality impacts are not anticipated with any of the construction alternatives. Neither particulates nor gaseous emissions should pose a problem along the corridor or in the communities. Background air quality is good and should not be significantly impacted by any of these alternatives. Anticipated noise impacts due to the various alternatives would be minor, and would not exceed appropriate design noise levels for the land use categories along the corridor. Campgrounds would be most impacted. However, these impacts would be minimized for all of the alternatives, due to the fact that peak noise levels will occur during the low-use periods of the campgrounds.	Flood hazard area encroachment is limited. Roadway elevations are well above 100-year flood elevations. The toe of the roadway fill extends into the flood plain of the Flathead River between Martin City and Coram. The floodways of Abbot Creek and several intermittent drainages would be crossed, but no adverse impact is expected. Flood plain intrusions are limited with these alternatives. Proper alignment selection will limit the intrusion of the roadway fill into the flood plain. The consequences of this intrusion would not be significant for any of these alternatives. The floodways of Abbot Creek and several intermittent drainages are crossed without adverse impacts. Roadway elevations are all well above the 100-year flood event.	The two primary species on the threatened and endangered species list which potentially could be affected by the project are the bald eagle and the grizzly bear, both of which are threatened. No significant adverse impact on the bald eagle is expected with any of the alternatives. Impacts to the grizzly include the possibility of inhibiting movements between larger habitat areas. It is generally agreed that the wider the highway, the more difficult it is to cross, and therefore the wider alternatives have greater adverse impact than the narrower alternatives. However, no alternative other than possibly the 88-foot highway is likely to jeopardize the continued existence of the grizzly bear. These five alternatives would increase the roadway width which would result in a limited potential for minor adverse impact to wildlife and, to a lesser extent, vegetation. Generally, the potential severity of impacts would be proportional to the width of roadway involved. Precautions will be taken to protect fishery resources of the area. The impact on the wetlands will be minimized, although two small wetland areas will be filled. However, they are not major habitat areas and the impact will be minor.	Population (Year 2000): 3,050 New Housing Units (Year 2000): 322 Annual Sales Revenue: $6.75 million The projected growth is expected to result in additional demands on municipal utilities and community services. Population (Year 2000): 2,812 New Housing Units (Year 2000): 213 Annual Sales Revenue: $6.50 million Public services and utilities are expected to be maintained at about current levels. Population (Year 2000): 3,050 New Housing Units (Year 2000): 322 Annual Sales Revenue: $6.75 million The projected growth is expected to result in additional demands on municipal utilities and community services. Population (Year 2000): 2,446 New Housing Units: 293 Baseline Annual Sales Revenue: $5.50 million Community services would continue at the current level.	Design Speed: 60 mph Traffic Capacity (urban): Level A Traffic Capacity (rural): Level B Accidents: 1.4 acc/mvm Traffic will flow freely with optimum safety. Pedestrian/bicyclist facilities will be provided. Design Speed: 60 mph Traffic Capacity (urban): Level A Traffic Capacity (rural): Level B Accidents: 2.2 acc/mvm Traffic will flow smoothly and with reasonable safety. Pedestrian/bicyclist facilities will be provided. Design Speed: 60 mph Traffic Capacity (urban): Level A Traffic Capacity (rural): Level C-D Accidents: 2.2 acc/mvm Traffic would encounter some summertime congestion. Safety would be reasonable. Pedestrian/bicyclist facilities will be provided. Design Speed: 60 mph Traffic Capacity (urban): Level A Traffic Capacity (rural): Level D-F Accidents: 2.0 acc/mvm Traffic would encounter stop-and-go conditions in the summertime. Safety would be reasonable. Pedestrian/bicyclist facilities will be provided. Design Speed: 60 mph Traffic Capacity (urban): Level A Traffic Capacity (rural): Level B Accidents: 2.2 acc/mvm Traffic will flow smoothly and with reasonable safety. Pedestrian/bicyclist facilities will be provided. Design Speed: 40 mph Traffic Capacity (urban): Level A Traffic Capacity (rural): Level E-L Accidents: 3.7 acc/mvm Significant congestion now occurring will continue to worsen. Above-average accident rates would continue. No pedestrian/bicyclist facilities will be provided.	Two historic sites exist near the proposed route, but will not be affected. A beneficial impact in terms of improved access to recreational sites is expected with any of the five alternatives involving roadway improvement. Utilities have generally been buried or located outside of the highway corridor. Scenic easements have been purchased to limit development near the highway and preserve the natural appearance of the area. The visual image should be significantly enhanced by these measures.	This alternative would require taking 20 feet of the 50-foot-wide roadside park in Hungry Horse. The use of the remaining 30 feet as a park would be marginal, and the area would probably be converted to a roadside landscaping area. This action would have a significant adverse impact on the parkland in the corridor. None of the other alternatives would affect any parkland along the highway corridor.	The volume of earthwork and the number and sizes of construction vehicles would be greatest for this alternative. This would result in the greatest disruption of vegetation and disturbance to wildlife during construction. Air and water quality could be adequately protected with proper construction practices. The economic benefits of the construction phase would be greatest. Substantial earthwork utilizing large machinery would be required, with corresponding potential for disruption of vegetative cover and wildlife. Air and water quality could be adequately protected with proper construction practices. Significant employment and economic benefits would occur. Significant earthwork would require the use of heavy construction machinery. The zone of disruption for the biological environment would be slightly less than for the four-lane alternatives. Water and air quality could be safeguarded utilizing appropriate construction procedures. Employment and economic benefits would result from the construction activity. The least amount of earthwork and site disruption involving construction would occur with this alternative. Proper construction practices would protect air and water quality. Lesser employment and economic benefits would be gained. Substantial earthwork utilizing large machinery would be required, with corresponding potential for disruption of vegetative cover and wildlife. Air and water quality could be adequately protected with proper construction practices. Significant employment and economic benefits would occur. No construction would be involved. Thus, there would be no construction-related impacts.	Construction Cost: $11,243,976 Annualized Capital Cost: $1,320,711 Annual Maintenance Cost: $65,034 Annual Benefits: $1,540,786 Benefit/Cost Ratio: 1.17 Construction Cost: $9,404,003 Annualized Capital Cost $1,104,590 Annual Maintenance Cost: $51,918 Annual Benefits: $1,436,766 Benefit/Cost Ratio: 1.10 Construction Cost: $8,658,626 Annualized Capital Cost. $1,017,039 Annual Maintenance Cost: $45,906 Annual Benefits: $1,259,211 Benefit/Cost Ratio: 1.24 Construction Cost: $7,933,856 Annualized Capital Cost $933,905 Annual Maintenance Cost: $36,255 Annual Benefits: $1,047,808 Benefit/Cost Ratio: 1.15 Construction Cost: $9,438,498 Annualized Capital Cost: $1,108,642 Annual Maintenance Cost: $51,918 Annual Benefits: $1,436,766 Cost/Benefit Ratio: 1.30 Construction Cost: N.A. Annualized Capital Cost: N.A. Annual Maintenance Cost: $73,603 Annual Benefits: N.A. Benefit/Cost Ratio: 1.00
PREFERRED ALTERNATIVE — 64′ FOUR-LANE A FOUR-LANE HIGHWAY THAT WOULD BE 64 FEET WIDE IN RURAL AREAS AND CONSIST OF FOUR 12-FOOT TRAVEL LANES, A 4-FOOT MEDIAN, AND TWO 6-FOOT SHOULDERS. IN URBAN AREAS THE HIGHWAY WOULD BE 66 FEET WIDE AND CONSIST OF FOUR 12-FOOT TRAVEL LANES AND TWO 9-FOOT PARKING LANES.									
ALTERNATIVE 2 — 60′ FOUR-LANE A 60-FOOT FOUR-LANE HIGHWAY CONSISTING OF TWO 12-FOOT TRAVEL LANES AND A 4-FOOT SHOULDER IN EACH DIRECTION, WITH A 4-FOOT PAVED MEDIAN OR TURNING LANES WHERE DETERMINED NECESSARY IN THE RURAL AREAS, AND A 14-FOOT-WIDE CENTER SECTION TURNING LANE IN THE DEVELOPED AREAS.										
ALTERNATIVE 3 — SPECIAL DESIGN TWO-LANE A SPECIAL-DESIGN TWO-LANE HIGHWAY INCORPORATING SUCH IMPROVEMENTS AS 1.9 MILES OF TRUCK-CLIMBING LANES, 2.3 MILES OF LEFT-TURN LANE, 1.0 MILE OF BOTH CLIMBING AND TURNING LANES, AND TURNOUTS IN RURAL AREAS, AND A 16-FOOT-WIDE CENTER SECTION TURNING LANE IN THE DEVELOPED AREAS.									
ALTERNATIVE 4 — 44′ TWO-LANE A 44-FOOT-WIDE TWO-LANE HIGHWAY CONSISTING OF A 12-FOOT TRAVEL LANE AND A 10-FOOT SHOULDER IN EACH DIRECTION.										
ALTERNATIVE 5 — NO-BUILD NO NEW CONSTRUCTION WOULD BE PROVIDED. THE EXISTING CONDITION USING TWO 10-FOOT LANES WITH 1-FOOT SHOULDERS WOULD REMAIN.	No construction would be involved. Thus, no related adverse or beneficial impacts would occur.	No construction or significant change will occur and thus no related impacts would occur. No air quality changes would be expected except for those due to increased traffic. Since the existing corridor will not be altered, no significant impact under this alternative is anticipated. Traffic noise will continue to be of minor significance.	A limited amount of flood plain encroachment is occurring with the existing roadway. The toe of the roadway fill extends slightly into the flood plain and channel of the Flathead River between Martin City and Coram. The diking action of the roadway grade is possibly contributing to the extent of upstream flood hazard areas at the crossings of the floodways of Abbot Creek and intermittent drainages.	Since no construction would take place, little impact is anticipated on the vegetation, wildlife and wetlands along the corridor, except for that due to increased traffic.			No impact is anticipated for this alternative due to the fact that no construction or alignment changes would occur.			

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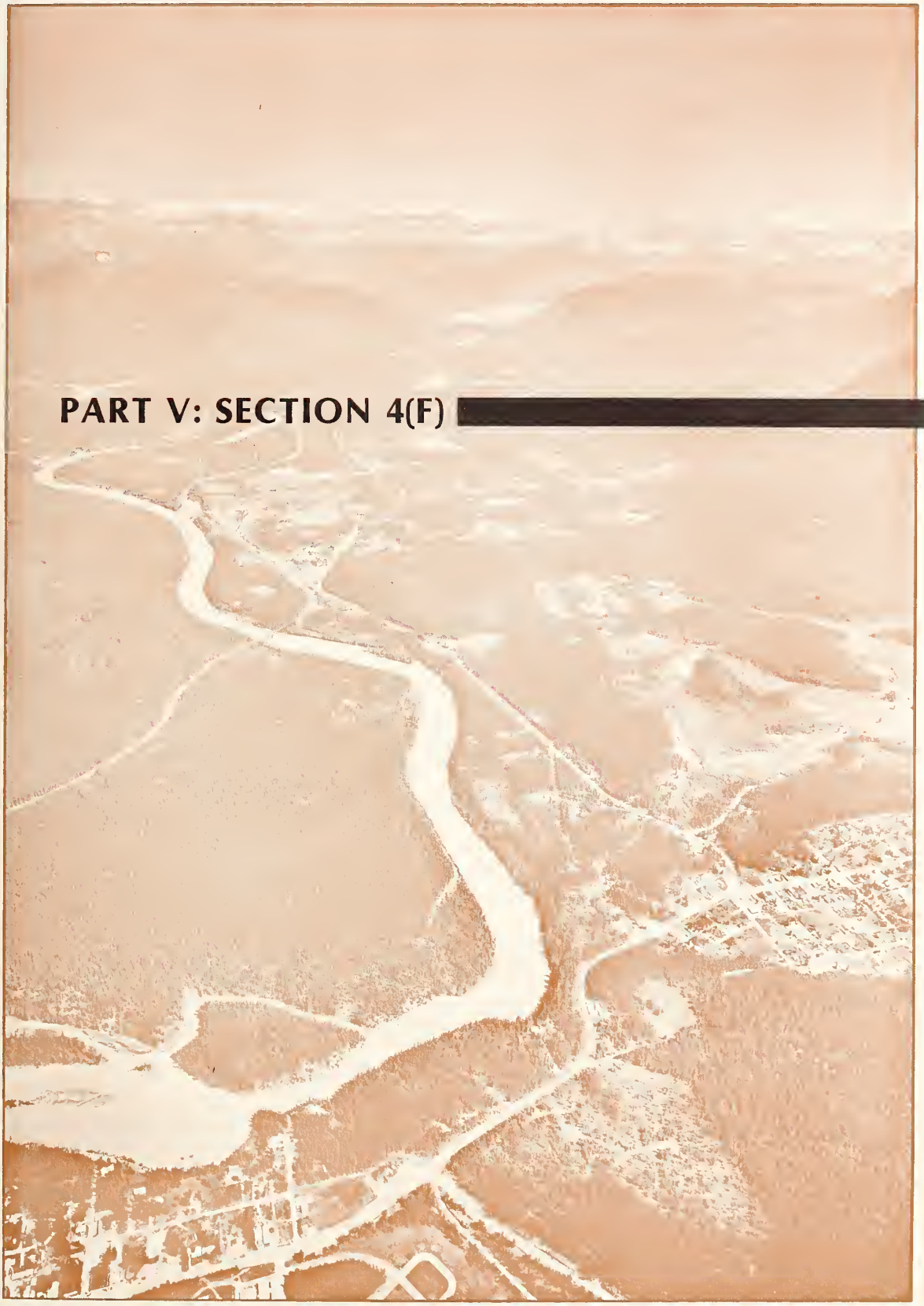

PART V: SECTION 4(F)

PART V: SECTION 4(f) EVALUATION

A. PURPOSE AND REQUIREMENTS

The 4(f) evaluation is intended to provide information on significant publicly owned parks, recreation areas, wildlife and waterfowl refuges or historic sites that would be affected by the project. Section 4(f) of the U.S. Department of Transportation Act requirements as described in the October 30, 1980 Federal Register include the following provisions:

> "No administration action will use land from a significant publicly owned park, recreation area, or wildlife and waterfowl refuge or any significant historic site unless a determination is made that:
>
> (1) There is no feasible and prudent alternative to the use of land from the property, and
>
> (2) The proposed action includes all possible planning to minimize harm to the property resulting from such use."

The purpose of this Section 4(f) evaluation is to identify potentially affected publicly owned properties, and to demonstrate that the project complies with the Section 4(f) requirements.

B. SECTION 4(f) RESOURCES

The original Section 4(f) evaluation [Project F-257(16)] completed in the EIS prepared in 1974 identified two Section 4(f) properties that would be affected by highway construction. These properties, which include the Forest Service Campground at Hungry Horse and three roadside parks in Hungry Horse, are shown in Figure 28. A recent inventory of the area's recreational properties, cultural and historic resources, and wildlife and waterfowl refuges was completed and two properties of historic significance were identified in addition to the Hungry Horse properties. The Belton Chalets, a National Register of Historic Places property, and the Belton Railway Depot, recently determined eligible for inclusion in the National Register, are located at West Glacier adjacent to U.S. Highway 2.[1,2]

C. IMPACTS

1. U.S. FOREST CAMPGROUND AT HUNGRY HORSE

The U.S. Forest Service Campground at Hungry Horse was closed for public use in September, 1973 and has been inactive since that time. The Forest Service has no plans to reopen the campground, and does not consider the campground to be Section 4(f) property. The Forest Service has determined and the Federal Highway Administration Division Office concurs that this property is not a significant recreation area and a Section 4(f) evaluation is not required. A letter to this effect is on file with the Federal Highway Administration office in Helena.

2. ROADSIDE PARKS AT HUNGRY HORSE

Right-of-way through the Hungry Horse parks was purchased for this project and compensation was made to Flathead County in the form of playground improvements at the Hungry Horse School. However, due to the court case that halted this project, a new Section 4(f) evaluation is being made on the taking of park property from the original park boundary.

The existing park consists predominantly of a grassed area between U.S. Highway No. 2 and Hungry Horse Boulevard. In this grassed area are a clearing ball used in the construction of Hungry Horse Dam along with legend monuments, and several picnic tables.

Of the highway improvement alternatives considered for this project, only the 88-foot four-lane would require taking of property from the Hungry Horse roadside parks. This alternative would require using 22,500 square feet of the 56,000-square-foot park area. The clearing ball in the park would be within the right-of-way purchased, but would be about five feet outside of the curb line and would not be moved. The land remaining for the park would be reduced from 50 feet wide to 30 feet wide, and use of such a narrow strip of land for a park would

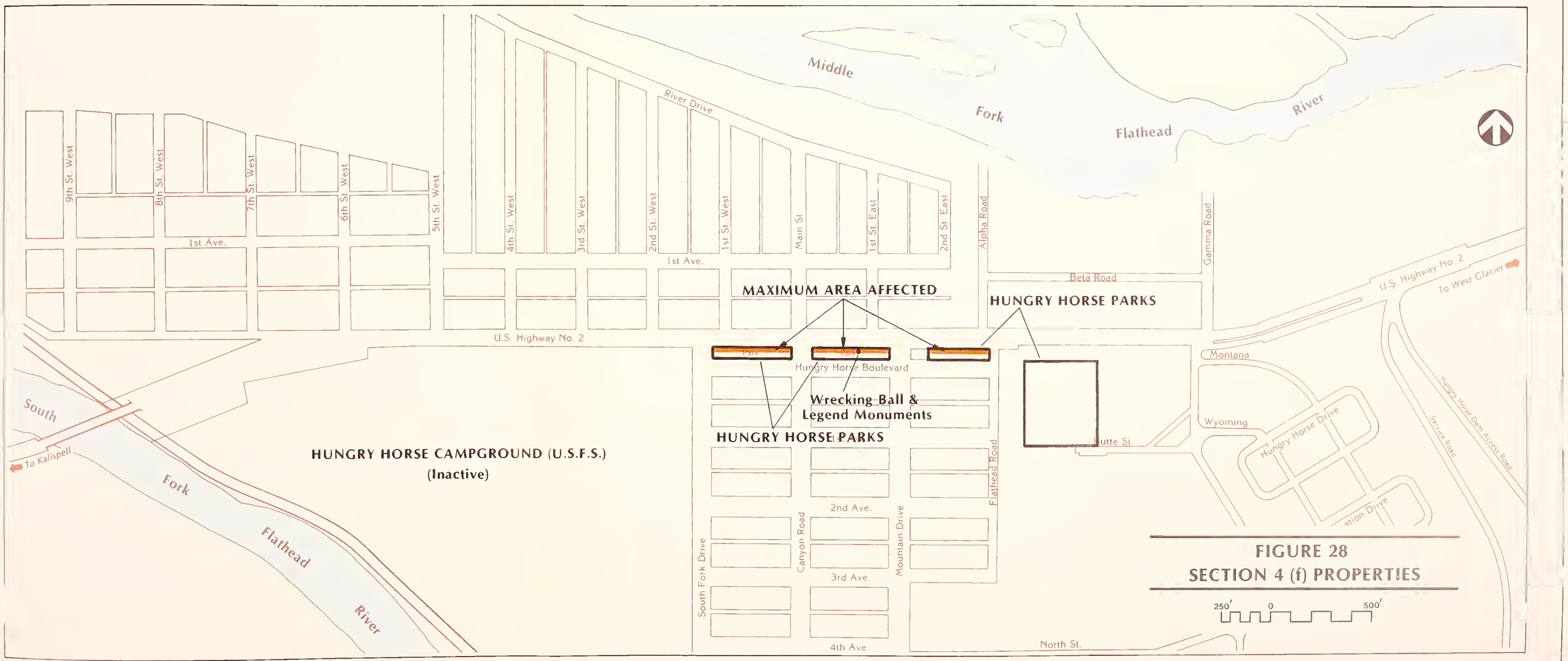

FIGURE 28
SECTION 4 (f) PROPERTIES

be marginal. However, the curb and gutter improvement will eliminate present drainage problems and enhance the appearance of the parks.

None of the remaining alternatives, including the preferred alternative, would require taking any park property. Construction nearest the park will consist of sidewalk, curb and gutter, and a parking lane. These facilities will aid the use of the park and buffer the park from the traffic lanes, allowing the park to function much as it does now. Therefore, no Section 4(f) determination will be required.

3. HISTORIC SITES AT WEST GLACIER

The Belton Chalets and the Belton Railway Depot in West Glacier are historic sites near the project but are not located within the right-of-way for construction. Evaluations of potential impacts on the historic sites due to roadway construction determined that neither site will be affected. Determination of No Effect statements were prepared for both properties and the findings were concurred with by the Montana Historical Society, Historic Preservation Office.[1,3] Documentation for the No Effect Determination for each site is on file at the FHWA Office in Helena.

D. MITIGATION

Since no impacts to Section 4(f) properties are expected, no mitigation measures are necessary. However, benefits to the existing park lands that will occur as a result of the project include drainage improvements at the roadside parks including curb and gutter and a storm drainage system, and sidewalks that will provide better and safer pedestrian access to the parks. Similar benefits will occur at the historic sites in West Glacier.

E. COORDINATION

Correspondence with agencies with jurisdiction over Section 4(f) properties is on file with the Montana Department of Highways in Helena. This correspondence contains the coordinating efforts with appropriate agencies that were made for this Section 4(f) Evaluation.

F. CONCLUSION

The conclusion of this Section 4(f) Evaluation is that there are no Section 4(f) properties that will be affected by this project.

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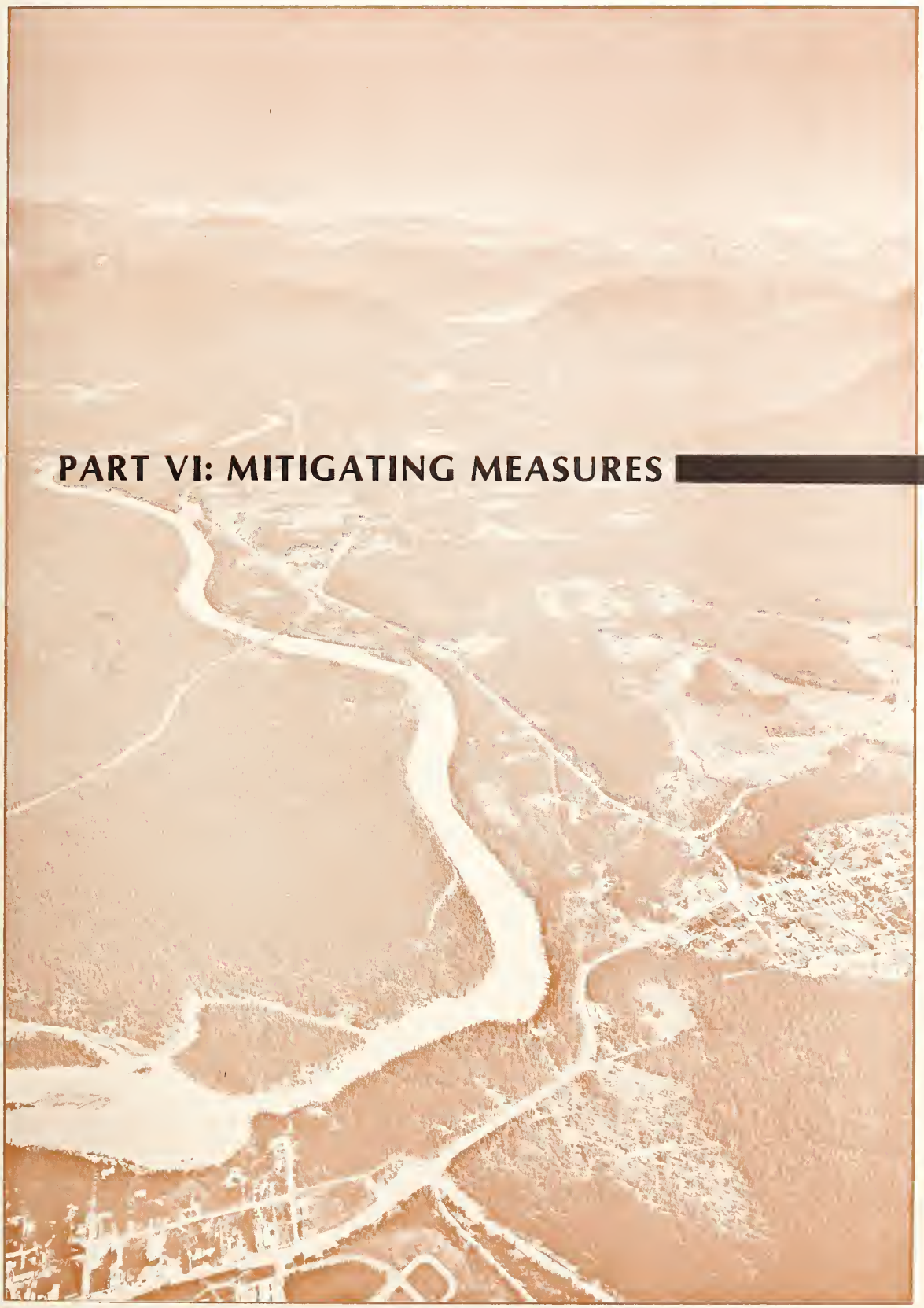


PART VI: MITIGATING MEASURES

PART VI: MITIGATING MEASURES

There are a number of mitigating measures that will be taken to reduce the impact of the proposed highway. These measures include the following.

A. GEOLOGY AND SOILS

Specific data regarding the properties and limitations of soils and rock to be encountered during construction will be evaluated during the design phase. This information will provide parameters for slope design, slope stability and determination of proper excavation techniques and will aid in the development of quantities of road cut and fill areas.

B. VEGETATION

During construction, much of the topsoil will be disturbed for earthwork operations. The topsoil will be removed, stockpiled, and used to cover cut and fill areas for replanting of vegetation. Impacts upon the existing tree screen will be minimized by removing only the necessary vegetation during clearing activities. The establishment of strict construction limits will prevent unnecessary disturbance of vegetation by clearing and general construction activities.

The removal of the forest overstory along the right-of-way that was cleared has resulted in a number of animals, particularly elk and white-tail deer, being attracted to the cleared areas to feed. This hap-

pens especially in early spring when emergence of new green vegetation occurs first along the open roadside. An example of this is the relatively large number of elk that utilized the clover and grasses in the cleared right-of-way in the spring of 1981.

All biologists contacted for information concerning wildlife and revegetation of the right-of-way recommended the selection of unpalatable species for revegetation. The consensus was that the unpalatable plant species would attract fewer animals to the right-of-way area during early spring green-up, and a lower number of vehicle-animal conflicts could be expected. A list of unpalatable plant species that will be planted in the revegetated areas has been prepared and is available at the Department of Highways office in Helena.

C. SURFACE WATER PROTECTION

To afford an extra margin of safety in the protection of surface water resources, all applicable MDHES Stormwater Runoff Guidelines as recounted in Table 16 (Part IV) will be implemented. Most significant among these is the use of detention facilities for any system of central stormwater runoff collection. These facilities will afford a minimum of 45 minutes of hydraulic detention, and will trap a majority of runoff and sediment-related pollutants prior to discharge to a receiving watercourse. The broken topography of the corridor will minimize the occurrence of substantial point-source flows other than in conjunction with central collection systems.

Statutory cooperative review of highway designs by various state natural resource agencies will afford further assurance against adverse impacts. Proper design allowances for surface water protection including vegetative buffer strips along watercourses, dispersion of stormwater runoff, and erosion and runoff control during construction will be required.

D. FISH

Abbot Creek is the only creek supporting fish which is crossed by the highway. This creek is an important spawning area for fish coming from the Flathead River. To allow the passage of spawning fish, the crossing will be a steel culvert buried two feet below the stream bed that will maintain a natural stream bed. The construction for this crossing will occur between June 15 and September 15 to avoid adverse effects on spawning trout. By June 15, most of the spring runoff will have passed and spawning and hatching of eggs from redds of rainbow and cutthroat trout will have been completed. Brook trout and possibly bull trout would begin spawning after September 15.

E. MAMMALS

To minimize the impact on mammals, the highway will be kept as narrow as practical within the limitations of meeting traffic and safety

needs. At the northern end of the project where bears may be crossing the highway, vegetation cover will be re-established to within 15 feet of the roadway. The intent would be to create bear crossings by providing relatively narrow crossing exposure.

Openings in forest habitats and the vegetation growing therein attracts many species of wildlife. If this occurs in the cleared right-of-way along a highway, the wildlife becomes vulnerable to being hit by traffic. Vegetation of a height sufficient to provide escape cover (six feet) and still shade out succulent forbs and grasses will be planted or allowed to encroach to within 15 feet of the highway. These shrubs will not be palatable to wildlife occurring in the area.

Large mammal road kills will be removed from the highway. This will prevent the attraction of carrion eaters including bears, birds, and numerous species of smaller mammals to the highway. Since salt is an attractant to many species of wildlife, it would not be used for de-icing the highway except where essential for human safety.

F. WETLANDS

Two wetland areas will be crossed by the highway and two small wetland areas will be filled. The areas to be filled are not significant for wildlife habitat; however, adjacent wetland areas are moderately used by wildlife. To protect these wetland areas, culverts and other drainage structures will be installed so that present wetland areas can be maintained without danger of being drained. In addition, vegetative screens now in place will be left in place and enhanced by additional screen planting to minimize disturbance to wildlife utilizing the wetland areas.

G. PEDESTRIAN SAFETY

The mitigating measures for pedestrian facilities can be divided into three categories: 1) parallel facilities (for pedestrians travelling along the highway); 2) crossings (for pedestrians crossing the highway); and 3) education programs. These categories are discussed in the following narrative.

1. PARALLEL FACILITIES

For all alternatives, sidewalks will be provided in developed areas where there is sufficient pedestrian volume to warrant their inclusion. These locations will include Hungry Horse, Coram and West Glacier, at a minimum. From Hungry Horse to Coram, a separate bikeway/walkway will be provided to serve pedestrian and bicycle traffic between these communities. From Coram to West Glacier, the preferred alternative includes six-foot shoulders to be used as a bikeway.

2. CROSSINGS

Pedestrian crossings will be provided at locations where sufficient pedestrian traffic is available or is expected to occur in the future. No significant crossing locations now existing will be deleted.

During design, a detailed traffic analysis will be conducted by the Department of Highways to determine the type of pedestrian crossing appropriate for the area.

3. EDUCATION PROGRAMS

Many pedestrian accidents are due to lack of knowledge or training. The Montana Department of Highways will request that the Traffic Education and Safety Section of the State Superintendent of Public Instruction conduct an evaluation of the traffic safety education programs in schools along the corridor, and make recommendations for improvements in the traffic education program as well as for proper school crossings.

H. SOUTH FORK BRIDGE

The South Fork Bridge has a large number of single-cause accidents (icy conditions) that have a high potential for correction. A delineation project recently completed shows some decrease in accidents at this location already. This bridge location will be evaluated further to see if it is an appropriate location for an additional highway safety project.

I. VISUAL

Visual vegetative barriers will be planted where large areas are opened for highway facilities to retain the cohesiveness of the visual environment and the rustic feel of the communities. Liberal use of natural materials and earth tones will be encouraged whenever possible in this project.

Vegetative screening using indigenous species will be used to prevent any adverse visual impacts along the Wild and Scenic River from highway structures. In particular, drainage structures and proximate earth fills will be effectively screened with vegetation.

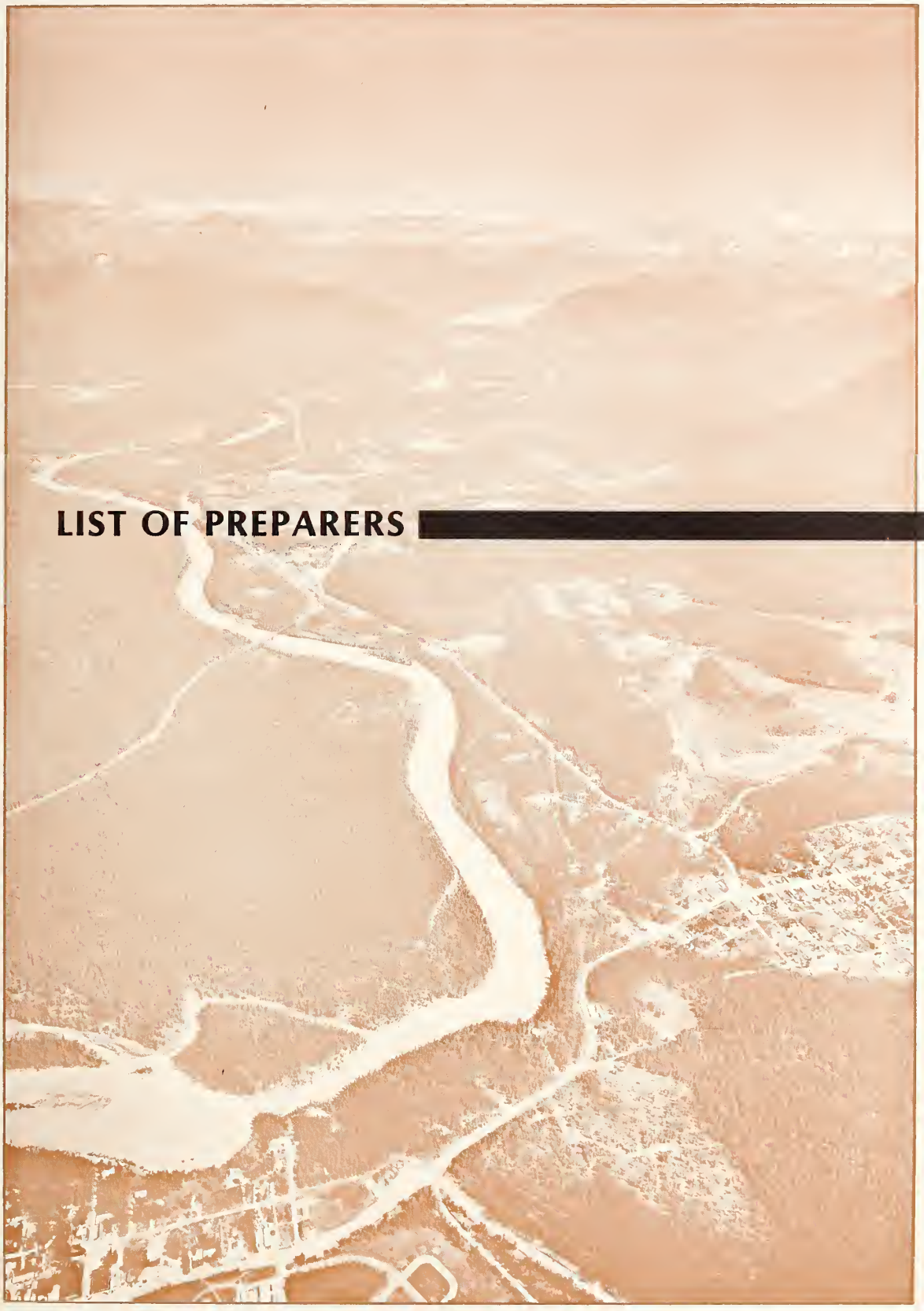
J. SCENIC BEAUTIFICATION PLAN

A scenic beautification plan was prepared for this project by the Department of Highways using the concepts of enhancement of existing desirable features, restoration of areas that have been damaged, and preservation of important characteristics. This beautification plan will

be used as a guideline for any new design on the project. Scenic easements have already been purchased and are an important element of the scenic beautification plan.

K. CONSTRUCTION

Construction practices will conform to all applicable state and federal guidelines relating to the protection of environmental quality. These guidelines will include, but would not be confined to, requirements for revegetation of denuded areas, protection of waterways through the use of temporary runoff detention facilities and/or silt fences and natural drainage barriers, the use of undisturbed buffer zones where practical around sensitive environmental features, and submission of a drainage handling plan by the contractor(s) along with supervision to assure conformance to the plan. Particularly during dry and windy conditions, construction haul roads will be watered to control dust nuisances.



LIST OF PREPARERS

LIST OF PREPARERS

This Environmental Impact Statement was prepared by the Montana Department of Highways and Federal Highway Administration with the assistance of private firms. The primary agencies and the individuals involved with the preparation of this EIS are as follows:

MONTANA DEPARTMENT OF HIGHWAYS

Gordon Larson, Supervisor, Consultant Design Section, Preconstruction Bureau
Mark Leighton, Civil Engineer, Consultant Design Section, Preconstruction Bureau
Philip Colbert, Supervisor, Traffic Operations Section, Planning and Research Bureau
Kathleen Ellis, Attorney, Legal Division
William Hutchinson, Attorney, Legal Division

FEDERAL HIGHWAY ADMINISTRATION

William Dunbar, Environmental and Design Engineer
H.J. Ollila, Environmental Engineer

ROBERT PECCIA & ASSOCIATES, INC.

Barry Damschen, Vice-President and Project Director
Robert Peccia, President and Traffic Engineer
Alden Beard, Environmental Engineer
James Taylor, Civil Engineer
Douglas Widmayer, Civil Engineer
Donald Peccia, Industrial Plant Engineer
Daniel Norderud, Environmental Planner
James McGowan, Geographic Planner
Gayle Parrish, Editor and Typist
David Litz, Graphic Designer
Barbara Poad, Graphics Assistant
Joan Anderson, Graphics Assistant

T.A.P., INC.

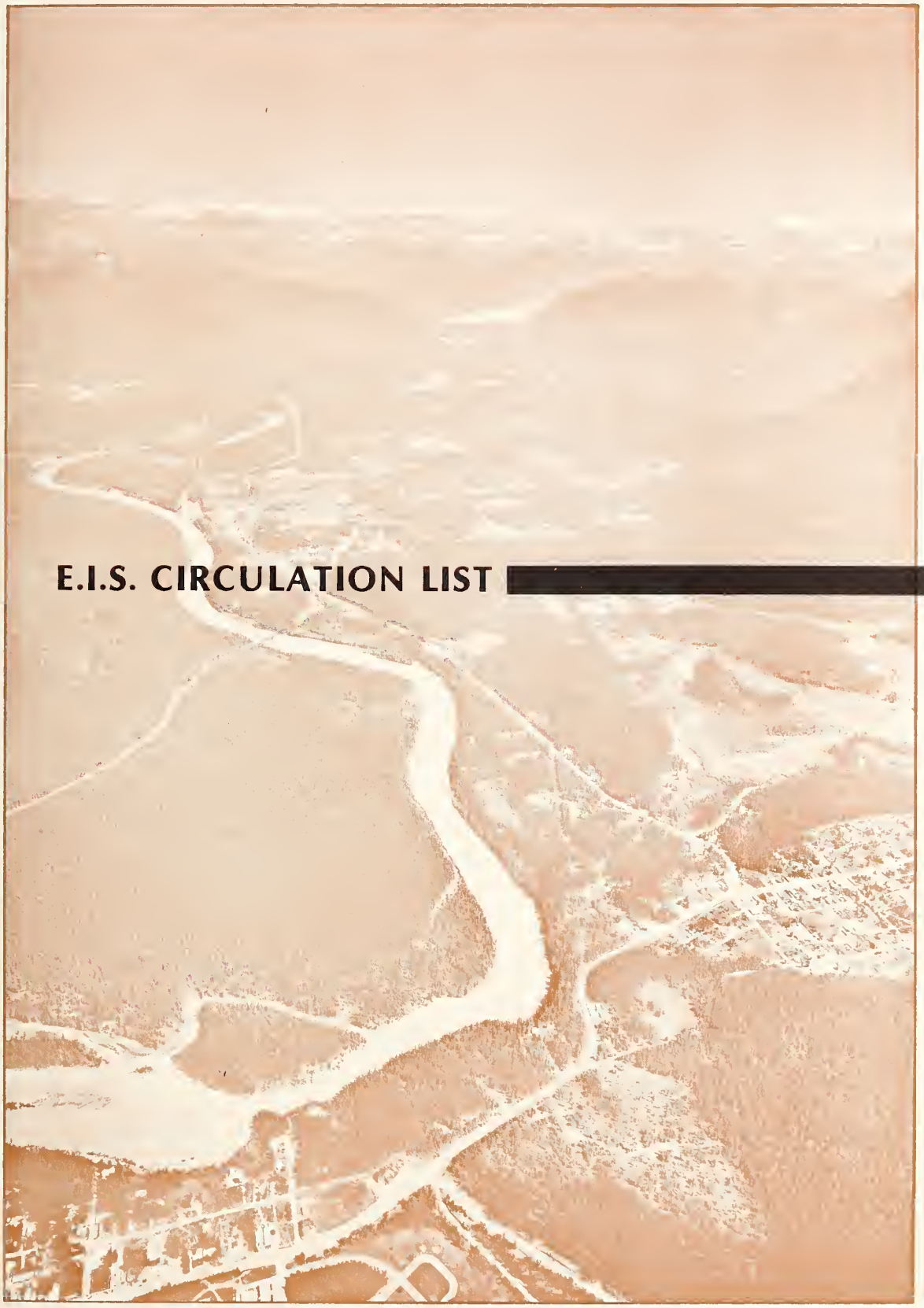
Monte Eliason, Vice-President, Economic Planning and Research
Carol Ricketts, Research Assistant

OLSON-ELLIOTT & ASSOCIATES

Gerald Moore, Plant Ecologist
Catherine Ream, Wildlife Biologist

LEN VISUAL DESIGN

Leonard Eckel, Visual Designer



E.I.S. CIRCULATION LIST

E.I.S. CIRCULATION LIST

FEDERAL

Bureau of Indian Affairs
Area Director, Billings Area
U.S. Dept. of the Interior
316 North 26th Street
Billings, Montana 59101

Bureau of Reclamation
Pacific Northwest Region
Attn. PN 150
Box 043
Boise, Idaho 83724

Department of Agriculture
Forest Service
Hungry Horse Ranger Station
Office of the District Ranger
Hungry Horse, Montana 59913

Department of Agriculture
Forest Service, Region 1
Regional Forester
Mr. Tom Coston
Federal Building
Missoula, Montana 59801

Department of Agriculture
Soil Conservation Service
35 West Reserve Drive
Kalispell, Montana 59901

Dept. of Health & Human Services
Office of Environmental Affairs
Office of the Director
200 Independence Avenue SW
Room 537F
Washington, DC 20201

Dept. of Housing & Urban Development
Office of the Director
Federal Building
Drawer 10095
Helena, Montana 59626

Dept. of Housing & Urban Development
Ms. Betty Miller, Regional Administrator
Executive Tower Building
1405 Curtiss Street
Denver, Colorado 80202

Department of the Interior
Bonneville Power Admin.
Environmental Coordinator
Box 3621
Portland, Oregon 97208

Department of the Interior
Bureau of Land Management
Box 30157
Billings, Montana 59107

Department of the Interior
Bureau of Mines
Chief, Western Field Operation Center
East 315 Montgomery
Spokane, Washington 99207

Department of the Interior
Fish & Wildlife Service
Mr. Wally Steucke
Federal Building, Room 3035
316 N. Twenty-Sixth Street
Billings, Montana 59101

Department of the Interior
National Park Service
Planning & Resource Preservation
Mr. Richard Strait
Assoc. Regional Director
Rocky Mtn. Regional Office
Box 25287, 655 Parfet Avenue
Denver, Colorado 80215

Department of the Interior
Office of Environmental
Project Review
Washington, DC 20242

Department of the Interior
Office of Surface Mining
Regional Director, Region 5
1020 Fifteenth Street
Denver, Colorado 80202

Department of the Interior
U.S. Geologic Survey, MS-104
Chief, Environmental Impact
Assessment Program
Reston, Virginia 22092

Department of the Interior
U.S. Geologic Survey, MS-760
Chief, Environmental Impact
Assessment Program
Reston, Virginia 22092

Department of the Interior
U.S. Geological Survey, WRD
Federal Bldg., Drawer 10076
Helena, Montana 59626

Department of the Interior
Water & Power Resources
Region P.N.
Federal Building & Courthouse
Box 043
Boise, Idaho 83724

Department of Transportation
Federal Aviation Administration
Rocky Mtn. Region, ARM 615
10455 E. Twenty-Fifth Avenue
Aurora, Colorado 80010

Department of Transportation
Federal Highway Admin.
301 South Park Avenue
Drawer 10056
Helena, Montana 59626

Environ. Protection Agency
Deputy Regional Administrator
Region VIII
Suite 900, 1960 Lincoln Street
Denver, Colorado 80203

Environ. Protection Agency
Office of Federal Activities
EIS Filing Station (A-104)
401 M Street, Southwest
Washington, DC 20460

Flathead Drainage 208 Project
Marc M. Spratt, Director
723 Fifth Avenue East
Kalispell, Montana 59901

Small Business Administration
Federal Building, Fifth Floor
Helena, Montana 59601

Soil Conservation Service
Office of the State
Conservationist
Box 970, Federal Building
Bozeman, Montana 59715

STATE

Dr. Les Davis
Department of Anthropology
Montana State University
Bozeman, Montana 59715

Dept. of Commerce
Aeronautics Division
Box 5178
Helena, Montana 59620

Dept. of Fish, Wildlife & Parks
Recreational Parks Division
Environment & Information Division
1420 East Sixth Avenue
Helena, Montana 59601

Dept. of Health &
Environmental Sciences
Air Quality Bureau
Cogswell Building
Helena, Montana 59620

Dept. of Health &
Environmental Sciences
Water Quality Bureau
Cogswell Building
Helena, Montana 59620

Dept. of Natural
Resources & Conservation
Office of the Director and
Administrator, Conservation
Dist. Division
32 South Ewing
Helena, Montana 59620

Department of State Lands
Office of the Commissioner
1625 Eleventh Avenue
Helena, Montana 59620

Environmental Quality Council
Office of the Director
Box 215, Capitol Post Office
Helena, Montana 59620

Dr. Charles Jonkel, Director
Border Grizzly Project
School of Forestry
University of Montana
Missoula, Montana 59812

Mr. John McMaster
Legislative Council
Capitol Room 138
Helena, Montana 59601

Montana Historical Society
Historic Preservation Officer
Veteran's Memorial Building
225 North Roberts Street
Helena, Montana 59620

Montana Highway Patrol
Mr. Martin Neuhausen
125 Park Avenue
Kalispell, Montana 59901

Montana State Library
930 East Lyndale
Helena, Montana 59620

Dr. Robert Ream, Director
Wolf Ecology Project
School of Forestry
University of Montana
Missoula, Montana 59812

Senator Max Baucus
Attn: Steve Rovig
1107 Dirksen
Senate Office Building
Washington, DC 20510

Senator Max Baucus
Attn: Carlene Nimlos
Box 7488
Missoula, Montana 59807

State Clearinghouse
Attn: Agnes Zipperian
Capitol Annex
Helena, Montana 59620

LOCAL

Board of County Commissioners
Flathead County Courthouse
Kalispell, Montana 59901

Flathead Co. Extension Service
Merle M. Lyda, Chairman
Box 638
Kalispell, Montana 59901

Flathead County Safety Council
Ms. Ruth Delhay, Ex. Sec.
Box 1011
Kalispell, Montana 59901

Flathead County Sheriff Dept.
Lt. Tom Trahey
P.O. Box 1076
Kalispell, Montana 59901

Flathead County Sheriff Dept.
Mr. Kenneth Sorley
Hungry Horse, Montana 59919

The Honorable Cecil V. Hudson
Mayor of Columbia Falls
Drawer G
Columbia Falls, Montana 59912

The Honorable Leroy McDowell
Mayor of Kalispell
P.O. Box 1035
Kalispell, Montana 59901

Mr. Henry Oldenburg
Flathead County Commissioner
Flathead County Courthouse
Kalispell, Montana 59901

The Honorable Hank Olson
Mayor of Whitefish
City Hall
Whitefish, Montana 59937

Mr. Robert Souhrada
Superintendent of Schools
School District #6
Columbia Falls, Montana 59912

Mr. William Wheeler
Flathead County Surveyor
Box 100
Kalispell, Montana 59901

PRIVATE ORGANIZATIONS & INDIVIDUALS

Action on Transportation
Ms. Marian K. Agnew, Ex. Dir.
Box 50065
Washington, DC 20004

American Wilderness Alliance
4260 E. Evans Avenue, Suite 8
Denver, Colorado 80222

Kent Anderson
Box 523
Hungry Horse, Montana 59919

Don Bean
Box 144
Coram, Montana 59923

Big Sky Magic
Mr. Lawrence Dodge
Box 60
Helmville, Montana 59843

Joan Bird
Environmental Information Ctr.
137 Main
Kalispell, Montana 59901

Lex Blood
880 Blackmer Lane
Columbia Falls, Montana 59912

Mr. Lee Boccia
Deleuw, Cather & Company
234 Columbine
Denver, Colorado 80206

Iola Breneman
Box 131
Coram, Montana 59913

Hollis Broderick
287 South Many Lakes Drive
Kalispell, Montana 59901

Don Bromley
West Glacier, Montana 59936

Burlington Northern Railroad
Division Office
Mr. J. K. Aust
North Higgins Avenue
Missoula, Montana 59801

Burlington Northern Railroad
Timber & Land Managment
Donald Nettleton, Director
700 South Avenue West
Missoula, Montana 59801

Canyon Mountaineers 4-H Club
Mrs. Catherine Richter
Box 387
West Glacier, Montana 59936

Coalition for Canyon Preservation
Bradley Chase
Box 422
Hungry Horse, Montana 59919

Coalition for Canyon Preservation
Ms. Sharlon Willows
Box 422
Hungry Horse, Montana 59919

Columbia Falls Chamber of Commerce
Pat Campbell, President
Box 321
Columbia Falls, Montana 59912

Columbia Falls Womens Club
Ms. Patricia Rosse
710 Kelley Road
Columbia Falls, Montana 59912

Mary Ellen Connelly
Box 214
Whitefish, Montana 59937

Mr. James Conner
78 Konley Drive
Kalispell, Montana 59901

Jay Cornish
834 West Mercury
Butte, Montana 59601

June Corbett
Box 24
Coram, Montana 59913

Jeffrey Crook
27691 SE Haley Road
Boring, Oregon 97009

Daily Inter Lake
727 East Idaho
Kalispell, Montana 59901

W. J. Dakin
Box 215
Coram, Montana 59913

Mr. Rob Deyerberg
Box 607
Hungry Horse, Montana 59919

Leslie Dillon
Box 3
Hungry Horse, Montana 59919

Max Edgar
West Glacier, Montana 59936

Roger Elliott
Box 'R'
Columbia Falls, Montana 59912

Russ Erickson
Box 116
West Glacier, Montana 59936

Robert A. Evand
7233 North 23rd Place
Phoenix, Arizona 85020

Dorothy Fisher
Box 224
Coram, Montana 59913

Ray Fisher
Coram, Montana 59913

Flathead Electrical Co-op, Inc.
501 LaSalle Road
Kalispell, Montana 59901

Flathead Energy Council
Dan Grinde
Box 628
Bigfork, Montana 59911

Flathead Wildlife, Inc.
Mr. Lee Bennett, President
Box 4
Kalispell, Montana 59901

Carol L. Fleming
Box 78
Coram, Montana 59913

Eleanor Franklin
Box 222
Coram, Montana 59913

F.M. Gannon
4624 Highway 12 West
Helena, Montana 59601

Paul Geossler
Box 203
Coram, Montana 59913

Susan Giannettino
Box 1282
Kalispell, Montana 59901

Glacier-Canyon Development Association
Hungry Horse Star Route
Columbia Falls, Montana 59912

Jacob Grant
Box 215
Coram, Montana 59913

James Grant
Box 921
Columbia Falls, Montana 59912

Frances Green
Box 247
Coram, Montana 59913

Ed Hanson
Box 5
Coram, Montana 59913

Jon L. Heberling
745 South Main
Kalispell, Montana 59901

Vicky Henricksen
Box 295
Coram, Montana 59913

Hungry Horse Homemakers
Eileen R. Boyd, Secretary
Hungry Horse, Montana 59919

Hungry Horse News
Brian Kennedy
926 Nucleus Avenue
Columbia Falls, Montana 59912

Hungry Horse Volunteer Fire Department
Hungry Horse, Montana 59919

Ramona Huso
Kevin, Montana 59454

Neil Hyde
929 Thirteenth Street West
Columbia Falls, Montana 59912

The Institute of Technology
Mr. H. Paul Friesema
Holcomb Research Building
4600 Sunset Avenue
Indianapolis, Indiana 46208

T. Destry Jarvis
Director of Federal Activities
National Parks & Conservation Association
1701 18th Street SW
Washington, DC 20009

Clayton Johnson
Box 118
Hungry Horse, Montana 59919

LaVerne Johnson
Hungry Horse, Montana 59919

Sheryl & Calvin Jorgensen
Box 252
Coram, Montana 59913

Kalispell Chamber of Commerce
Box 978
Kalispell, Montana 59901

Kalispell Weekly News
529 First Avenue East
Kalispell, Montana 59901

Frank A. Kellenbeck
Box 292
Coram, Montana 59913

Mr. Daniel Kemmis
317 Woody
Box 8687
Missoula, Montana 59807

Lucille Kickbush
Coram, Montana 59913

Virgil Lane
Box 66
Coram, Montana 59913

Marilyn M. Lazo
P.O. Box 114
West Glacier, Montana 59936

League of Women Voters
Claire Strickler
192 Larch Lane
Columbia Falls, Montana 59912

Amy Lester
339 West Montana Street
Kalispell, Montana 59901

Dan Lundgren
c/o West Glacier Mercantile
Box 398
West Glacier, Montana 59936

Madison-Gallatin Alliance
Ms. Joan Montagne, President
Box 875
Bozeman, Montana 59715

Mary McCann
West Glacier, Montana 59936

John McCaslin
28 River Road
Kalispell, Montana 59901

The Missoulian
Box 1535
Missoula, Montana 59801

Montana Automobile Association
Box 4129
Helena, Montana 59604

Montana Chamber of Commerce
Box 1730
Helena, Montana 59601

Montana Stockgrowers Assn.
Office of the Secretary
Box 1679
Helena, Montana 59601

Montana Wilderness Association
Ms. Elaine Snyder
Box 112
Kila, Montana 59920

Montana Wildlife Federation
Box 901
Helena, Montana 59601

Nancy Moser
Silver Tip Ranch
Highway 2
Martin City, Montana 59926

Ellen Murphy
304 Clancy Street
Helena, Montana 59601

Stephen J. Nardi
30 Fifth Street East
Kalispell, Montana 59901

Don Nash
222 South Hilltop Road
Columbia Falls, Montana 59912

Kent Newman
Box 224
West Glacier, Montana 59936

Emil & Marie Nommensen
Coram, Montana 59913

Janett Nicklaus
Box 248
Martin City, Montana 59926

Northwestern Telephone
Systems, Inc.
1111 First Avenue East
Kalispell, Montana 59901

Northwestern Telephone
Systems, Inc.
Mr. Mike Hascall
284 Wishart Road
Columbia Falls, Montana 59912

Tom Pittenger
Box 184
West Glacier, Montana 59936

Fred H. Poloson
234 Circle Drive
Columbia Falls, Montana 59912

Roslyn Ransier
99 Northern Lights Boulevard
Hungry Horse, Montana 59919

A. B. Reed
Box 6
Coram, Montana 59913

Sharon Renton
Box 566
Hungry Horse, Montana 59919

Lester Reynolds
491 Eckelberry Drive
Columbia Falls, Montana 59912

Paul Richards
P.O. Box 4656
Helena, Montana 59604

Catherine Richter
San-Suz-Ed Campground
Coram, Montana 59913

Tom Ridenour
Box 35
West Glacier, Montana 59936

Charles A. Risser
Box 207
Hungry Horse, Montana 59919

Jim Robbins
508 Stewart
Helena, Montana 59601

Randy Schwickert
Box 947
Whitefish, Montana 59945

Art Sedlack
Box 164
West Glacier, Montana 59936

E. C. Seeley
West Glacier, Montana 59936

Ray & Ingrid Serra
Coram, Montana 59913

Merle Shupe
Box 295
Martin City, Montana 59926

Jim Siemer
815 Fifth Avenue West
Kalispell, Montana 59901

Sierra Club
Bitterroot Mission Group
Mr. Leo Joron
545 Beverly Avenue
Missoula, Montana 59801

Skrotzki Associates
Mark Skrotzki
Box 234
Woody Creek, Colorado

Martha Sloan
Box 26
West Glacier, Montana 59936

Richard & Patricia Stevens
Box 265
West Glacier, Montana 59936

Connie Stonehocker
4108 Highway 93 South
Kalispell, Montana 59901

Laura Strong
22 First Street West
Kalispell, Montana 59901

Robert L. Stump, Controller
Greyfound Food Management
Glacier National Park
Greyhound Tower
Phoenix, Arizona 85077

Nancy Swanson
P.O. Box 501
Whitefish, Montana 59937

Christopher Tesar
Box 81
Hungry Horse, Montana 59919

Dave Thompson
Box 415
West Glacier, Montana 59936

Tom Thompson
Box 86
West Glacier, Montana 59936

Top Dollar Auction
7365 Highway 2 East
Columbia Falls, Montana 59912

Charles Tustin
Box 112
Coram, Montana 59913

Twin Rivers Association
Mr. Thomas F. White
Hungry Horse Star Route
Columbia Falls, Montana 59912

Glenn Udsor
205 Meadows Road
Whitefish, Montana 59945

Valleys Preservation Council
Box 141
Huson, Montana 59846

VanDoren, Hazard & Stallings
Mr. Jerry Murphy
3030 Harbor Lane
Minneapolis, Minnesota 55441

Carl VanValkenburg
935 Sixth Avenue West
Kalispell, Montana 59901

Haleyon Ward
Box 215
Lakeside, Montana 59922

Arlene White
Box 117
Hungry Horse, Montana 59919

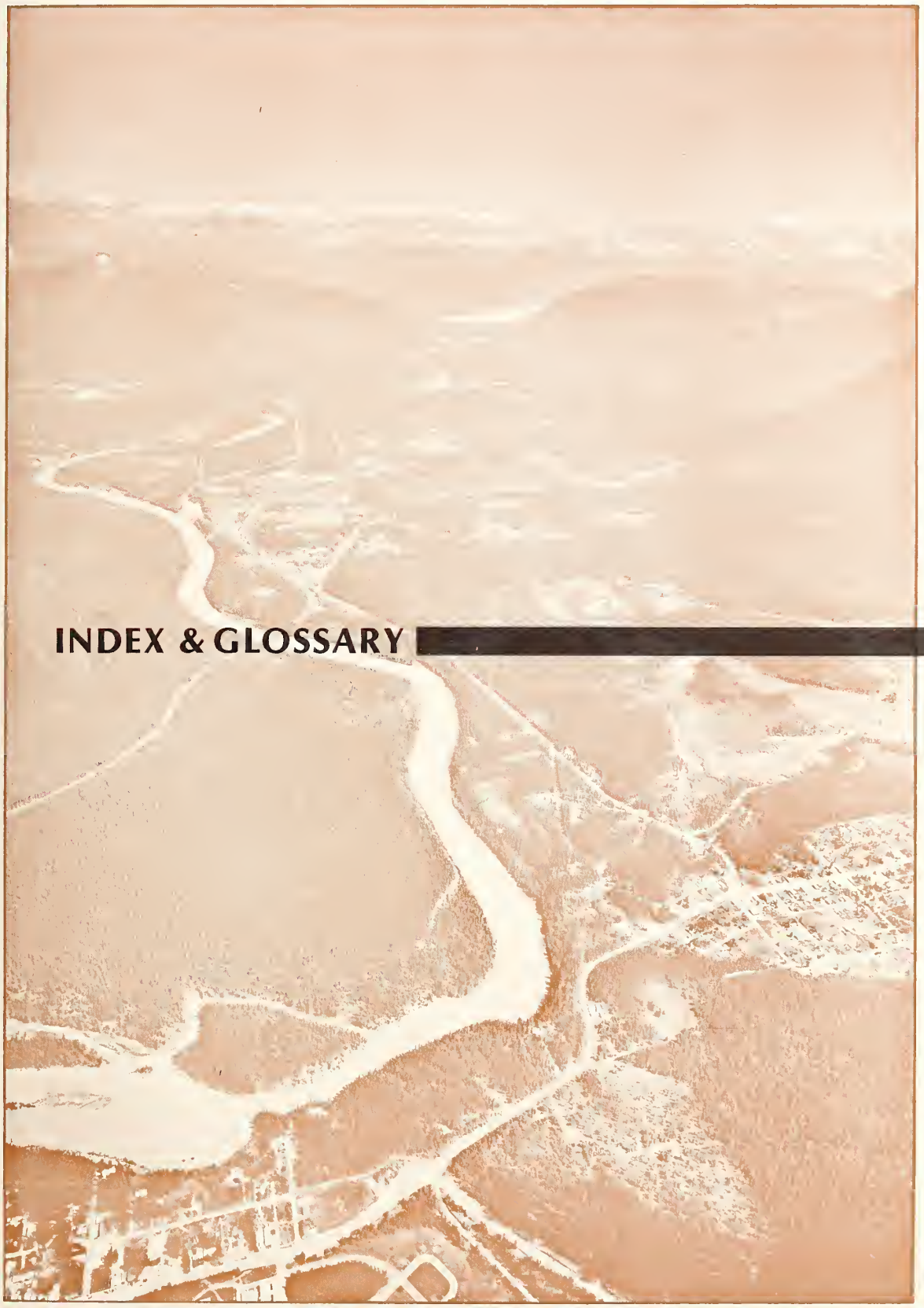
Water Sports Trailer Park
Box 338
West Glacier, Montana 59936

Whitefish Chamber of Commerce
Box 1309
Whitefish, Montana 59937

The Wilderness Society
Mr. Bill Cunningham
P.O. Box 1184
Helena, Montana 59624

Jamey Willows
Box 347
Hungry Horse, Montana 59919

Janet K. Young
Box 622
Columbia Falls, Montana 59912



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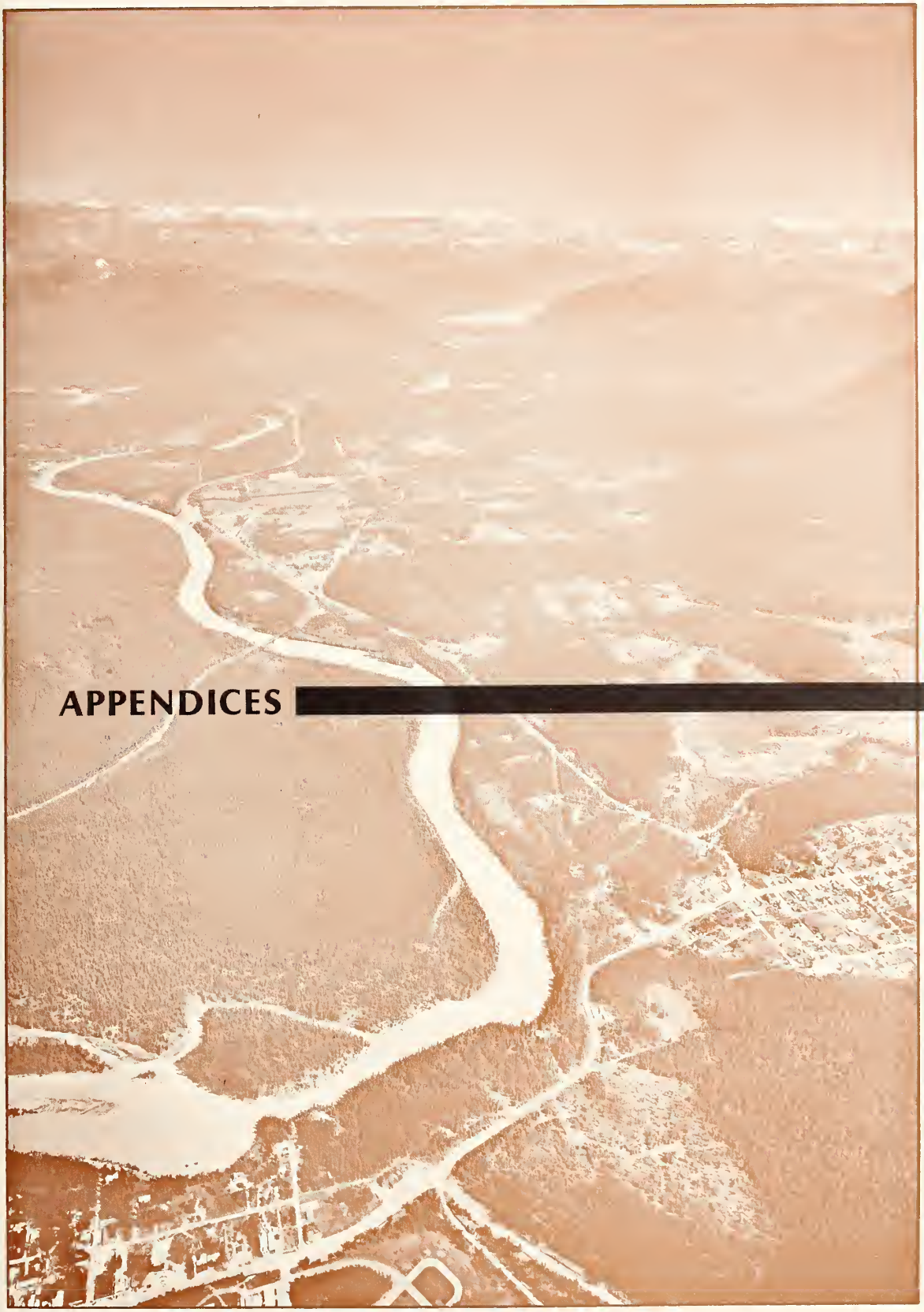
GLOSSARY

alignment: the ground plan of a highway
alluvium: unconsolidated sediments deposited by streams
ambient: existing background conditions
annual average daily traffic: a measurement of traffic derived by dividing the total year's traffic by 365; abbreviated as AADT
aquifer: a stratum of water-holding rock, especially one that supplies water for wells, springs, etc.
argillitic: made up of argillite, a metamorphosed shale, silt or clay
attenuation: a reduction in severity or lessening in force
baseline: existing situation or conditions used for comparison with future projections
B-1: A water classification of the State Water Quality Bureau for water which is suitable for drinking, culinary and food processing purposes, after conventional treatment; bathing, swimming and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply. Parameters for this classification can be found in ARM 16.20.618, 9/30/80.
biomass: that part of a given habitat consisting of living matter
biota: the flora and fauna of a region
boreal forest: a vegetation zone characterized by coniferous trees and which extends from southern Canada into the northern Rocky Mountains
breakland: over-steepened topography (i.e., stream banks) resulting from erosional processes
capacity: the maximum number of vehicles per unit of time that can be handled by a particular roadway component under the prevailing conditions
carry-over: air contaminants not dispersed in the atmosphere, absorbed by rain or snow and deposited on the ground near the source of the contaminants, or moved by wind to another location
curvature: the degree of curving of a highway surface
dBA: a weighted scale reading in decibels giving a measurement of sound level
design year: the year for which a particular facility is designed (usually 20 years from the date of construction)
dissolved solids: substances that are soluble in water but which remain as a residue when the water evaporates
DNRC: Montana Department of Natural Resources & Conservation
drop-off rate: a decrease in traffic noise levels proportional to an increase in distance from a roadway
effluent: discharged liquid, especially from septic tanks
EIS: Environmental impact statement
EPA: Environmental Protection Agency
eutrophication: deterioration of water quality characterized by growth of algae and high concentrations of organic material, which results in lower oxygen levels and warmer water temperatures harmful to aquatic life

fault: a fracture along which movement of rock along opposite sides occurs
FHWA: Federal Highway Administration
fluvial: concerning or pertaining to rivers or streams
heavy metals: metals such as lead, zinc and mercury that can be toxic in small quantities
housing unit: a house, apartment, group of rooms or single room occupied or intended for occupancy as separate living quarters
infrastructure: the organizational structure of a community (i.e., a mayor and city council)
intermittent stream: a stream which flows only during certain seasons of the year, especially during spring runoff, but which also receives part of its flow from groundwater
L10: the level of sound exceeded ten percent of the time, or exceeded six minutes in a 60-minute time period
MDHES: Montana Department of Health & Environmental Sciences
MDOH: Montana Department of Highways
mesoligotrophic: water which has a moderate amount of dissolved nutrients and oxygen, and is categorized between eutrophic and oligotrophic
non-attainment area: an area currently under a state implementation plan where present particulate levels exceed national standards as determined from actual sampling
non-point source discharge: an outlet of water dispersed from a wide area
oligotrophic: water which is deficient in nutrients and which has abundant dissolved oxygen with no marked stratification
overbreak: material outside a staked slope which falls into the cut because of unstable slopes, etc.
particulate: composed of distinct particles
perched water table: groundwater strata elevated above the normal aquifer level and underlain by an impermeable material such as clay
point source discharge: an outlet of water at a given point
primary impact: an impact directly resulting from an action (i.e., increased noise levels during construction)
redd: the spawning ground or nest of various fishes
riparian: of or related to the banks of streams of rivers
river management zone: a corridor along a designated Wild and Scenic or Recreational River which is intended to preserve the scenic or recreational qualities of the river
scenario: a possible course of development
scoping: the process used to identify the significant issues that should be addressed and the degree to which they should be addressed in the development of an Environmental Impact Statement
secondary impact: an impact indirectly resulting from an action (i.e., increased development in an area after access to the area is improved)

service level: a measurement of how well a highway is handling traffic; what speeds, delays and restrictions to traffic flow exist
sight distance: the distance visible to the driver of a vehicle, measured along the normal travel path of a roadway, to the roadway surface when the view is unobstructed by traffic
sufficiency rating: a process of rating a primary highway in order to compare it to other primary highways in the state
suspended solids: small particles of solids that do not readily settle out of water (i.e., clay particles)
terrestrial: of or relating to the land rather than to water
thirtieth highest hourly volume: a standard design criteria derived from the 30th highest of all hourly volumes ranked from low to high
trace: a barely discernible amount or indication of some quantity
ungauged: unmeasured
ungulate: the biological group comprising all hoofed mammals
visitor-day: A Forest Service measure of visitation to recreation facilities; equivalent to 12 hours of recreational use by one person



APPENDICES

APPENDIX A: TECHNICAL STUDIES

As part of the preparation of the Environmental Impact Statement for the Hungry Horse - West Glacier project, several technical studies were done to provide data on subject areas where insufficient information was presently available. These studies were considered too detailed and lengthy to include in the EIS report, and are on file with the Montana Department of Highways and are available for review. A brief description of these studies follows.

A. VEGETATION / WILDLIFE STUDY

A detailed vegetation/wildlife study was conducted by the ecological consulting firm of Olson - Elliott & Associates of Helena, Montana. The study consisted of literature research, field investigations, and interviews. A report was prepared for the project, and sections and excerpts thereof were included in the EIS. The edited version was reviewed and approved by Olson - Elliott. The complete text is available for review at the Montana Department of Highways office in Helena.

B. SOCIO-ECONOMIC STUDY

A detailed socio-economic study was conducted by the economic consulting firm of T.A.P., Incorporated of Bozeman, Montana. This firm relied on business and home questionnaires, personal interviews, census data, and other available information to make their assessments of the social and economic impacts of the project. The complete report is on file and available for review at the Montana Department of Highways office in Helena.

C. TRAFFIC STUDY

Traffic studies were conducted by the firm of Robert Peccia & Associates of Helena from information collected by the firm or provided by the Department of Highways. The manual and machine counts and calculations used for the traffic sections of this EIS are on file and available for review at the Montana Department of Highways in Helena.

D. WATER QUALITY INVESTIGATIONS

Water quality studies were conducted by the firm of Robert Peccia & Associates of Helena using information available from the Montana Department of Health and Environmental Sciences "STORET" data bank,

and USGS water quality data. Future estimates of water quality were based on Federal Highway Administration modeling techniques. Computations and background data are available for review.

E. NOISE ANALYSIS

Actual noise level measurements were taken using Montana Department of Highways noise measuring equipment at several locations along the corridor. In addition, the Federal Highway Administration's noise level modeling techniques using existing traffic composition were used to estimate and compare with actual noise level readings. Future noise levels were estimated based on the FHWA's noise level modeling techniques.

F. VISUAL ASSESSMENT

The visual impact assessment was done by Len Visual Design of Helena. The procedure used was to establish the visual resources by having a visual designer examine and evaluate the existing visual quality and determine essential features which should be retained, enhanced, or restored. The impacts of the proposed highway construction on existing visual resources were also assessed by the visual designer.

G. PRELIMINARY DESIGN AND COST ANALYSIS

Preliminary design for the various alternatives was conducted to establish the physical features of each alternative for analysis purposes. These features included alignment, grades, pavement widths, turning and climbing lanes, stream crossings, and storm drainage facilities. Construction costs for each alternative were estimated, based on anticipated quantities and unit prices from Montana Department of Highways bid tabulations. Maintenance costs were estimated using typical maintenance costs for similar highways from the Montana Department of Highways maintenance records.

H. OTHER STUDIES

Numerous other technical investigations including air quality, energy, geology and soils, transportation, historical and archaeological, recreation, etc. were also done as part of this EIS. These studies and background information are available for review at the Department of Highways office in Helena.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

Billings Area Office
316 North 26th Street
Billings, Montana 59101-1396

IN REPLY REFER TO:

SE

August 25, 1981

Mr. Volmer K. Jensen
Division Administrator
Federal Highway Administration
Federal Office Building
301 South Park, Drawer 10056
Helena, MT 59626

Dear Mr. Jensen:

This is the Fish and Wildlife Service's (FWS) biological opinion prepared in response to your June 30, 1981, request for formal consultation on the proposed Hungry Horse-West Glacier Highway project and its effects on the threatened grizzly bear (Ursus arctos horribilis). Through your biological assessment, the Federal Highway Administration (FHWA) concluded that formal consultation on the bald eagle is not required. The FWS concurs with that assessment. No highway construction has been identified or planned for the future by the FHWA or Montana Department of Highways (MDOH) through Badrock Canyon, an area where construction, should it occur, may affect the eagle (Ollila, pers. comm.). The FWS has examined the proposed project in accordance with the Section 7 Interagency Cooperation Regulations (50 CFR 402, 43 FR 870) and the Endangered Species Act, as amended. This biological opinion refers only to the potential affects on the grizzly bear and not the overall environmental acceptability of the proposed action.

Biological Opinion

Because a preferred alternative has not as yet been identified, we focused our analysis on Alternative No. 2, Alternative No. 4, and Alternative No. 5 as requested by the FHWA in your August 11, 1981, letter. These are the alternatives the FHWA believes to be the most feasible. Thus, this opinion is not based on the impacts of a four-lane, 88-foot-wide highway but rather upon an analysis of the three most feasible alternatives identified at this time by the FHWA.

It is the Fish and Wildlife Service's biological opinion that alternative No. 2 (Four-lane, 60-foot-wide Highway), No. 4 (Two-lane Special Design Highway), or No. 5 (No-build Alternative) if selected is not likely to jeopardize the continued existence of the grizzly bear.

Project Description

The FHWA and MDOH are proposing reconstruction of approximately 10.8 miles of U.S. Highway 2, between Hungry Horse and West Glacier. The draft EIS being prepared discusses the following alternatives: Alternative No. 1: Four-lane, 88-foot-wide Highway; Alternative No. 2: Four-lane, 60-foot-wide Highway; Alternative No. 3: Two lane, 44-foot-wide Highway; Alternative No. 4: Two-lane Special Design Highway; Alternative No. 5: No-build Alternative.

All alternatives include an eight foot pedristrian/bicycle path as part of the highway facility. Except for a few areas, the proposed road reconstruction follows the existing alignment. The MDOH received right-of-way authorization from the FHWA for the Coram to West Glacier segment in 1976. Right-of-way authorization for the Hungry Horse to Coram segment was received in 1978. Clearing of timber within the right-of-way corridor for a wide four-lane highway has already occurred over half the proposed alignment. A timber sale contract was awarded in 1978 by the U.S. Forest Service to remove timber from Forest Service parcels on the right-of-way for the Coram to West Glacier segment of the project. Timber cutting began in November 1978 and has since been completed.

Basis of Opinion

The major concerns of the proposed project with regard to the grizzly are (1) its effect on possible grizzly movement between the Apgar Mountains and the Flathead Range, and (2) potential secondary development and its indirect cumulative impacts on the grizzly.

The area between Hungry Horse and West Glacier, particularly the Lake Five area, may serve as a movement corridor for bears moving between the Apgar Mountains and the Flathead Range. A combination of topographical features, cover, and bear foods associated with the riparian zones in the Lake Five area make this area a logical movement corridor. The developments associated with the communities of Hungry Horse, Martin City, Coram, and West Glacier, and the relatively undeveloped Lake Five area in comparison may also tend to funnel bears through this area. Grizzly movement or use of the Lake Five area has been confirmed by past observations of grizzlies or their sign. The Montana Department of Fish, Wildlife, and Parks has trapped approximately three to four grizzlies in the Lake Five area over the last eight years (approximate) in response to complaints from area residents (Kis, pers. comm.). The developments and disturbances associated with the communities and roadside businesses in the project area presently impair the habitat quality and high

densities of grizzlies is not to be expected. The extent and degree of grizzly movement and use however, is unknown. No studies to monitor and establish grizzly use patterns have been conducted in this area.

The lack of information on grizzly use, however, should not be construed to mean that the area has little or no significance to the grizzly. Grizzlies typically have large home ranges in order to encompass the various habitat components needed to fulfill their biological requirements. Space and cover is required for bears to access these components and to move safely between them. Ridgetops, drainage bottoms, and fingers of cover often serve as movement corridors. As such, preventing the loss and fragmentation of grizzly bear habitat including movement corridors becomes particularly relevant to the survival of the species. Additionally, movement corridors that connect disjunct populations or subpopulations may be used by dispersing individuals which serves to "shore up" a population. Proper design of the project can help minimize the impacts to these functions that may be provided by the Lake Five area.

The FWS agrees with the statement in your draft EIS that "most wild animals, and especially those accustomed to seeking refuge from disturbance in forest cover, are reluctant to cross large openings such as a wide divided four-lane highway". Bears that may be crossing the present two-lane highway have gradually become accustomed to the corridor and have adjusted their behavior to accommodate the barrier and dangers it may present. A sudden change to a widened four-lane highway, however, may not be able to be instantly accommodated by the bear. Grizzlies typically will cross an opening where fingers of cover come together, decreasing the width of the opening. Thus, impacts from road construction can be minimized by keeping the width of the road and right-of-way corridor as narrow as practical in areas where bears are suspected to be crossing.

In order to minimize the impacts on the grizzly, the proposed road construction should meet the following objectives:

Between Coram and West Glacier,

(1) Keep the width of the road and highway corridor as narrow as possible.

(2) Restrict the number of climbing lanes, turning lanes, and pullouts to those considered absolutely essential for public safety.

(3) Allow vegetation that was removed when the present corridor was cleared in 1978 to encrouch to within 15 feet of the paved shoulder and within five feet of the pedestrian path. Low palatable species, such as those listed in the draft EIS, should be used for right-of-way revegetation to avoid attracting grizzlies and other wildlife.

(4) Remove road killed deer and elk to avoid attracting bears to the highway.

We believe that a four-lane, 60-foot-wide highway as described in Alternative No. 2 through the Lake Five area, would hinder movements of bears and other wildlife and increase the chance of those that do cross the highway to be hit by vehicles. Obviously, Alternative No. 5, the no-build alternative, would have the least impact on grizzlies. If the no-build alternative is unacceptable from the standpoint of travel needs and public safety, the above objectives, (given the three most feasible alternatives as identified by the FHWA for this consultation) can best be met through careful design of the road using Alternative No. 4. Under this alternative, the highway if properly designed can accommodate the special characteristics of the traffic in the area and minimize the impact on grizzly movement and use in the area.

Under Alternative No. 4, the FWS recommends that between Coram and West Glacier the number of pullouts and length of climbing lanes be held to an absolute minimum in order to provide a relatively narrow crossing exposure through as much of the area as possible. Minimum dimension standards should be used. The 10-foot shoulders under this alternative should be reduced to two 4-foot shoulders as was done in Alternative No. 2 (four-lane, 60-foot wide highway). Vegetation in the right-of-way corridor should be allowed to encroach to within 15 feet of the paved shoulder and five feet of the pedestrian path, as recommended in the draft EIS, to facilitate wildlife movement. Selected areas can be enhanced as animal travelways by planting low palatable shrubs (Table 3, Draft EIS) and conifers. Shepherdia canadensis is a key bear food and should be avoided.

With improved travel conditions and increased travel rates that are being projected for Highway 2 in the Hungry Horse-West Glacier area, secondary development can also be expected to occur. People, the garbage they generate, their developments, and their activities when superimposed over grizzly bear habitat, create the potential for adverse grizzly/human encounters resulting in either injury, property damage, or death to both people and bears. As already experienced by the community of West Glacier, conditions both natural and man-caused that attract grizzlies into close association with people are numerous in the West Glacier area. Increased development without adequate planning and control will increase the area of people/bear conflict.

The West Glacier people/bear conflicts occur primarily as an outgrowth of increased human numbers and activities without (1) local planning to avoid placing development and human activities in important grizzly bear habitat, and (2) proper control, management, and enforcement of people activities. With increased human pressures associated with the proposed road construction and growth of the Flathead Valley, the challenge to the communities peripheral to Glacier National Park, county, State and Federal agencies becomes one of (1) minimizing or eliminating where

possible the man-caused bear attractants, (2) learning to coexist with the level of grizzly use that will naturally occur, and (3) planning the development and activities of the community to avoid conflicts with the grizzly bear.

Following the aftermath of the fatal grizzly attacks in 1980 and the trapping/relocation efforts last fall in West Glacier in which six grizzlies were relocated, a West Glacier Area Study Team was formed to investigate the people/bear conflict and prepare management recommendations that could be taken by the local, state, and Federal agencies. The FWS believes it appropriate to include the recommendations of the West Glacier Area Study Team as an appendix to this consultation because of the spin-off effects road construction will have both on the grizzly bear and the communities in the West Glacier area. To help minimize the potential for conflicts between people and bears and to aid in the conservation of the grizzly, each city, county, state, and Federal agency should implement, where appropriate, the recommendations outlined by the Study Team.

This completes the FWS biological opinion on the effects the proposed Hungry Horse-West Glacier Highway project will have on the grizzly bear. If additional threatened or endangered species are listed, or conditions of the proposed project change, consultation with the FWS should be reinitiated.

Sincerely,

John G. Wood
Acting Area Manager

APPENDIX

FLATHEAD COUNTY

REFUSE DISPOSAL DISTRICT

FLATHEAD COUNTY

BOX 168
KALISPELL, MONTANA 59901

Memorandum

To: West Glaicer Area Management Agencies

From: Grizzly Bear Working Group Chairman

Subject: Final Recommendations

Review of preliminary recommendations has been completed and I am pleased to report that there was general support for their content and usefulness. Our group therefore recommends formal adoption so that planning for their implementation may be initiated. You may wish to consider a general agency meeting as a means for expediting approval. Should that not be feasible at this late date, we urge that each agency take the steps necessary to implement the recommendations.

As prelude to more general management, the Flathead County Disposal District is well along with plans to centralize refuse disposal near Coram. The site will be fenced, closely managed, and pickups made daily. We recognize that this will not resolve all bear management problems in the area, but do feel that it is a step in the right direction. There seems to be little doubt that refuse disposal is a key to problem solution and any assistnace that can be provided in setting up the new site will be appreciated. We are hoping that conversion to the new site can be completed by mid-summer.

Implementation of the remaining recommendations will require similar committment by each participating agency. Continuation of the cooperative atmosphere which currently exists will distinctly aid the implementation process. Our advisory group wishes to help in any way possible. Finally, you may wish to consider a joint news release on the recommendations.

Gary Stempin
Team Leader

5/29/81

GRIZZLY BEAR MANAGEMENT RECOMMENDATIONS AND OPTIONS FOR THE WEST GLACIER AREA.

Following is a priority listing of recommendations and/or options designed to reduce the potential for conflicts between grizzly bears and humans near West Glacier, Montana.

REFUSE DISPOSAL SITE

1. Fence and manage existing site so as to have greater control of public use, especially during nighttime hours and/or spring and fall.
2. Consider the use of a bearproof dumpster unit within the fenced disposal site to further deter use of the area by bears and other wildlife.
3. Implement a system of regular cleaning of dumpster units.
4. Implement more frequent container pickup during spring and fall or at other times when bears are known to be in the area.
5. Investigate the possibility for an alternate disposal site.
6. Establish a public information and education program on use of the refuse disposal site.
7. Rehabilitate and landscape old landfill sites around the refuse disposal site.
8. Experiment with deterrents and/or repellents at the disposal site as potentially effective agents become available.

RECREATION SITES

1. Use environmental analysis process to evaluate or expand recreation or other developments for their potential effects on bears.

5/29/81

2. Minimize potential conflicts at recreation sites by managing hours of use, locations, special use restrictions and refuse.

3. Extend National Park Service computer bear reporting system to public and private lands along the park boundry.

4. Develope a brochure on living in bear country to include refuse storage, vegetable gardens, disposal of game remains and other important items.

5. Document potential conflicts between livestock and bears.

OTHER ISSUES

1. Implement a program of aversive conditioning of bears which frequent populated areas.

2. Reduce future conlicts by incorporating bear management needs into county planning for the area.

3. Serve future residential or commercial expansion by commercial refuse haulers with county to provide guidance, rules, acceptable container types and other special needs.

4. County planning board should maintain an active information bank about bears for use by developers, residents, and agencies as a major means of reducing potential for conflicts.

5. Support sutdy efforts to determine (1) acceptable levels of confrontations, (2) habitat enhancement to attract bears away from people, and (3) acquisition of important bear habitats.

6. Provide park and local business the materials or encouragement to transmit information about bears to their employees and the public.

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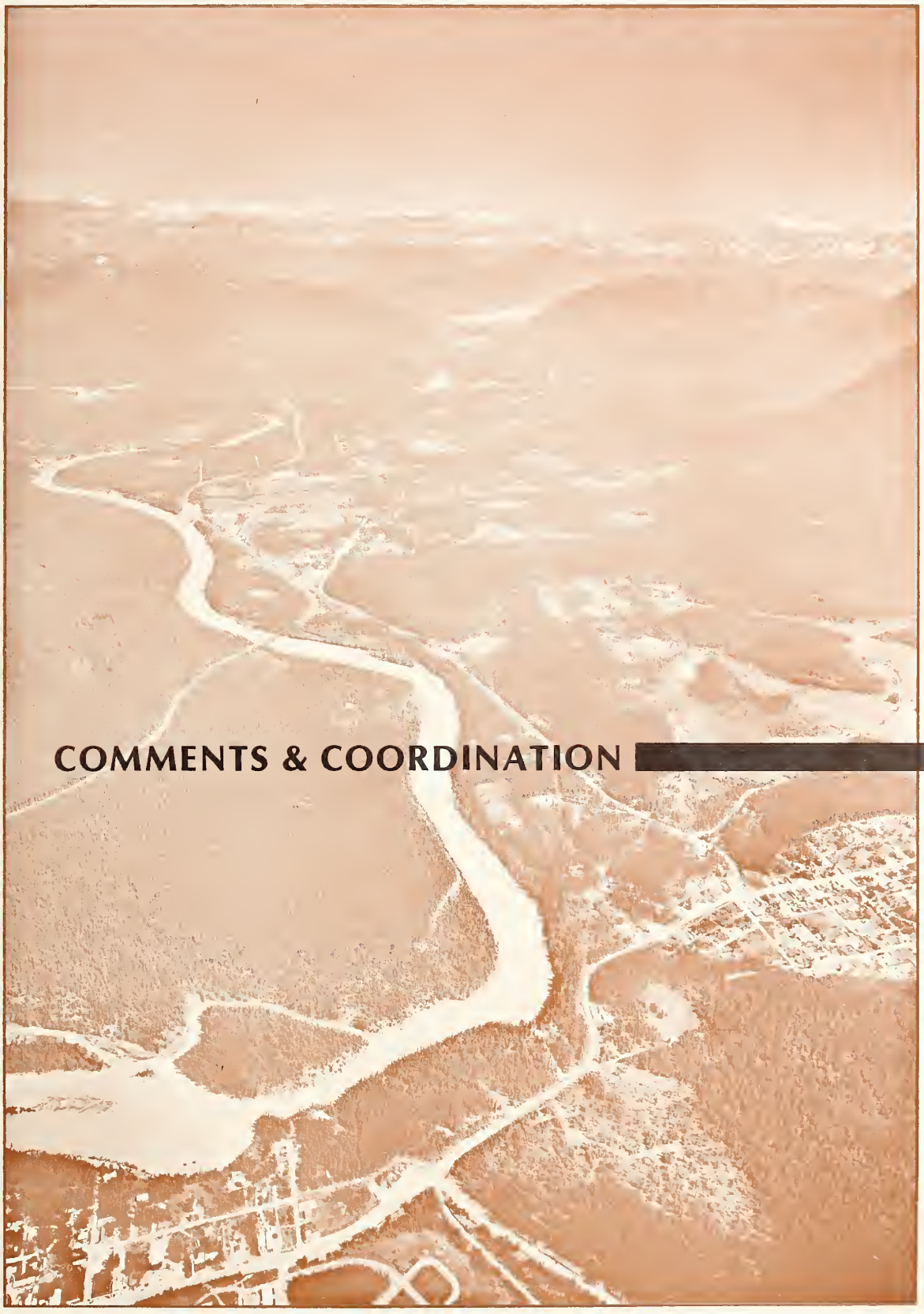

COMMENTS & COORDINATION

COMMENTS AND COORDINATION

A. OPPORTUNITIES FOR COMMENTS

Recognizing that this project is of interest to a great many people, a number of opportunities for comments were provided at both an early stage and throughout the development of the EIS. The major public notices, meetings, and opportunities for comment are listed as follows:

Notice of Intent to Conduct an EIS published in the Federal Register on February 26, 1981.

Scoping meetings to discuss the significant issues to be addressed in the EIS held on April 20 and 21, 1981.

Meetings on alternatives that were identified and considered appropriate for the project held on June 8 and 9, 1981.

Meetings on preliminary findings for some of the technical studies held on August 5 and 6, 1981.

Public Hearing for Draft Environmental Impact Statement and Location and Design held on November 18, 1981.

Government agency and public review and comments on the Draft Environmental Impact Statement report.

B. GOVERNMENT AGENCY COMMENTS AND COORDINATION

Several federal agencies were invited to be cooperating agencies for this project because of jurisdiction over elements of the EIS or special interest in the area. The agencies that were invited to be cooperating agencies are:

U.S. Department of Interior, National Park Service
U.S. Department of Interior, Fish & Wildlife Service
U.S. Department of Agriculture, Forest Service
U.S. Army Corps of Engineers
Environmental Protection Agency
U.S. Department of Housing & Urban Development

The federal agencies that agreed to participate as cooperating agencies are the National Park Service, Fish & Wildlife Service, and Forest Service. These agencies participated in the scoping process to identify significant issues, were provided interim information on which to comment, and were contacted for their comments during the preparation of the EIS. Letters from these agencies as well as other local, state, and federal agencies are on file at the Montana Department of Highways in Helena. In essence, the majority of the letters provide technical information or express special concerns on subjects which are under the jurisdiction of the particular agency.

The State Historic Preservation Officer assisted in evaluating the existing archaeological and historical resources, and in making the determination that the project would not have an impact on these properties. Other state agencies provided reviews, comments, and information as the EIS was being developed.

Government agency comments on the Draft EIS and appropriate responses are contained in this Final EIS.

C. CONSULTATION ON THREATENED OR ENDANGERED SPECIES

The biological assessment was submitted to the U.S. Fish and Wildlife Service for formal consultation on threatened or endangered species. The Fish and Wildlife Service responded to the Federal Highway Administration with a Biological Opinion, which is reproduced in Appendix "B".

D. PUBLIC HEARING COMMENTS

A combined Draft Environmental Impact Statement and Location and Design Public Hearing was held in the Conference Training Hall of Glacier National Park Headquarters in West Glacier, Montana on Wednesday, November 18, 1981 at 7:30 p.m. A discussion describing the project was presented by the Department of Highways, and comments on the project were received.

Approximately 210 people attended the Public Hearing, of which 54 gave testimony. Very likely a number of other people would have offered comments; however, the large number of people speaking resulted in the hearing continuing until 12:20 a.m., and a number of speakers had left by that time.

The 54 people who offered comments covered a wide range of issues including traffic volumes and safety, cost of the various alternatives, impact on Glacier National Park, impact on wildlife, pedestrian crossings, ability of the highway to handle truck traffic, impact on surrounding environmentally sensitive areas, employment and economic

benefits of the project, maintenance costs of the highway alternatives, potential pollution of storm water discharges, impact on the threatened eagle and grizzly bear, secondary development related to the highway, the scoping process that was used to identify significant issues, impact on park land, and parking in communities. These comments have been considered in the FEIS.

Anyone attending the public hearing could request a copy of the public hearing transcript by filling out a card with their name and address. Copies of the transcript can be obtained upon request to the Montana Department of Highways.

E. WRITTEN PUBLIC COMMENTS

Approximately 2,475 comments were received on the Draft EIS. These included petitions with 1,264 signatures, forms and cards with 1,056 signatures, and 155 letters. Due to the volume of the written comments, it is not practical to include all of them in the FEIS. Therefore, a separate document for public comments on the Hungry Horse - West Glacier Draft EIS has been compiled separately. This document is on file at the Montana Department of Highways in Helena and Kalispell, and may be obtained upon request.

The selection of a preferred alternative is not based on a numerical count of the public responses expressing a preference for a particular alternative. However, public opinion is important in assessing the criteria used for selection, and in providing information on public preferences. In this light, the following table which summarized the public comments received has been prepared.

ANALYSIS OF PUBLIC COMMENTS

	Petitions	Forms & Cards	Letters	Total
Four-Lane Alternatives				
Local	17	94	46	157
County	6	719	32	757
State	1	39	3	43
Other	0	8	0	8
Total:	24	860	81	965
Two-Lane Alternatives				
Local	40	10	12	62
County	339	67	25	431
State	612	83	24	719
Other	249	34	20	303
Total:	1,240	196	81	1,517
Other or No Alternative				
Local	0	0	6	6
County	0	0	6	6
State	0	0	8	8
Other	0	0	15	15
Total:	0	0	35	35

A summary of the substantive comments received is as follows:

* The traffic projections for the project and safety aspects of the alternatives were challenged by Skrotzki Associates, a traffic engineering firm from Woody Creek, Colorado. Mr. Skrotzki believes that there will be very little growth in traffic along this highway corridor, and that the two-lane alternatives are safer than the narrow four-lane alternative.

  Mr. Skrotzki's comments have been carefully reviewed. After consideration of his comments, the analysis contained in the EIS is still considered to be valid.

* The Coalition for Canyon Preservation questioned the scoping process for the EIS, the stormwater analysis, effects of the project on bald eagles and grizzly bear, secondary impacts of the project, and several other subjects.

  The Coalition's comments have been carefully reviewed. As a result of their comments, the scoping process and summary have been revised, and additional information has been included in the

FEIS on the bald eagle, grizzly bear, storm drainage system, and impacts on Glacier Park and other adjacent environmentally sensitive areas.

* The law firm of Jonkel and Kemmis, attorneys for the Coalition for Canyon Preservation, questioned the scoping process, the discharge of runoff into the Wild and Scenic River system, and "conclusory statements unsupported by empirical data".

The scoping process has been revised as discussed in the previous Coalition comment and response. We don't agree with Jonkel and Kemmis that the Wild and Scenic Rivers Act mandates that there be no discharge into a designated river, and stand by the analysis contained in the EIS that none of the alternatives will adversely affect the water quality of the river. We also believe that the conclusions that are contained in the EIS are supported by the data that is presented.

* The National Parks and Conservation Association was concerned that earlier comments they had made were not included in the EIS, that the project would adversely affect Glacier National Park and the rural scene leading up to the entrance of the Park, and that a four-lane highway would hamper wildlife movements.

The Association's earlier letter was on file and was considered in the scoping process although not specifically acknowledged, as were none of the other letters received. The discussion on the impact to Glacier National Park and the impacts on wildlife have been expanded in the FEIS.

* The President of the Flathead Audubon Society was concerned that the EIS did not properly address the potential impacts on the bald eagle and did not contain scientific comments by Dr. Riley McClelland.

The discussion on the potential impact to bald eagles has been expanded to include Dr. McClelland's comments.

* Mr. Douglas Peacock of Bozeman, Montana argued that the threatened grizzly bear is losing ground in its only viable ecosystem south of Canada, and that any development must be considered detrimental to the grizzly's status. Mr. Peacock preferred the no-build alternative.

Mr. Peacock's comments and opinions were noted.

* Mr. James Conner of the Flathead Energy Council commented that the 60-foot alternative would have to be widened to provide a suitable bikepath if a separate bikeway/walkway was not provided, he disagreed with the traffic and population projections, and requested that the EIS be footnoted.

The preferred alternative in the FEIS includes a shoulder bikeway from Coram to West Glacier, and as a consequence the shoulders have been widened to six feet for a 64-foot-wide section. The traffic and population estimates have been reviewed and considered to be reasonable. The FEIS is footnoted.

* Mr. Vekasi of West Glacier does not believe the area will experience the traffic growth projected in the EIS, and feels that a two-lane highway is as safe as a four-lane, and that a wider road provides more obstacles to wildlife.

Mr. Vekasi's comments and opinions are noted.

* Dr. and Mrs. Harvey Swanson of Whitefish feel that many points in the DEIS were inadequately addressed, the EIS showed a bias, and the draft was full of inconsistencies and contradictions.

From their comments and references to page numbers, it was apparent that Dr. and Mrs. Swanson reviewed a preliminary draft and not the Draft EIS report. However, their comments and opinions are noted.

* Leslie Dillon of Hungry Horse expressed concern about the safety of the 60-foot four lane, wanted to include a separate bikeway/walkway for the entire length of the project, and felt that the Draft EIS did not give adequate consideration to the U.S. Fish and Wildlife Service's Biological Opinion.

The comments and opinions expressed by Leslie Dillon are noted.

* The Montana Audubon Council prefers the two-lane special design, objects that Riley McClelland's remarks on the bald eagle were not included in the DEIS, and that the traffic projections are inaccurate.

Mr. McClelland's comments were considered in the FEIS. The traffic projections have been reviewed, and they are considered to be reasonable.

* Randy K. Schwickert, an attorney from Whitefish, believes there is insufficient factual data or expert opinion to support some of the statements in the EIS, disagrees with the benefit/cost analysis, was disturbed by "sweeping conclusions and seemingly unjustified opinions", and recommends the construction of the two-lane special design alternative.

Mr. Schwickert's comments and opinions are noted.

* One hundred and forty-three other written comments on the Draft EIS were received. A majority of these comments expressed a preference for either a two-lane or a four-lane alternative. Some letters brought out points which have already been discussed as a response to a government agency or other public comment. The comments that were received were noted and are included in the Public Comment Supplement to this FEIS.

AGENCY COMMENTS AND RESPONSES

The following section includes comments on the DEIS as submitted during the initial review period by federal, state and local government agencies. Agency comments were reviewed and responses to individual comments were drafted when appropriate. Comments generally suggested corrections to text and technical data and requested additional discussion of specific EIS subject matter. Practical and reasonable criticism was incorporated in the FEIS in an effort to improve the overall quality of the document. Modifications to the FEIS are identified in the responses that accompany agency letters.

When comments were not directed at specific points of the EIS or reflected only the author's viewpoint, lengthy responses were considered unnecessary. These comments have been acknowledged through the following self-explanatory responses:

A "No response required" response is given to comments which are statements that raise no specific questions regarding subject matter contained in the Environmental Impact Statement.

A "Your comments have been noted" response is given to comments that are considered substantive but do not require a specific response.

A "Your opinion has been noted" response is given to comments that are considered to be unsupported statements of opinion.

COMMENT

United States Department of the Interior
OFFICE OF THE SECRETARY
Building 67, Room 688
Denver Federal Center
Denver, Colorado 80225

ER 81/2138

NOV 13 1981

Mr. Volmer K. Jensen, Division Administrator
Federal Highway Administration
301 South Park, Drawer 10056
Helena, Montana 59601

Dear Mr. Jensen:

This is in response to the request for the Department of the Interior's comments on the draft environmental impact (DEIS) section 4(f) statement for U.S. Highway 2, Hungry Horse to West Glacier, Flathead County, Montana.

GENERAL COMMENTS

This document is an excellent example of a well written statement which succinctly evaluates the significant effects of the several potential alternatives. The outstanding graphics greatly assisted our review. Furthermore, the thorough scoping and early coordination efforts of the State highway agencies with our field-level offices warrant acknowledgment.

Page 44. We believe the statement that wolverine and elk are becoming less common is questionable. Supporting data for this conclusion would be of interest.

Page 53. Park Rangers do not have jurisdiction in the community of West Glacier.

Page 68. There is no proposed mining in Glacier National Park.

Page 89. It should be noted that 92 percent of Glacier National Park has been proposed for wilderness classification and is presently managed as such.

SECTION 4(f) COMMENTS

The section 4(f) portion of the document points out that only Alternative 1, an 88-foot wide, four-lane highway alignment would encroach on parklands or refuge lands. Any of the other alternatives discussed in the document offer feasible and prudent means of avoiding the Hungry Horse parks (and probably even the inactive Forest Service campground at Hungry Horse). Therefore, we would have no objection to selection of one of the other alternatives for this project to satisfy the purposes of section 4(f).

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RESPONSE

HUNGRY HORSE - WEST GLACIER E.I.S.

RESPONSE TO COMMENTS ON DEIS

Department of the Interior, Office of the Secretary
Denver, Colorado

No response required.

The statement that wolverine and elk are becoming less common was intended to convey a general trend over a long period of time. Although there have been fluctuations in the numbers of animals observed through various methods in recent years as evidenced through counts and trapping figures, the opinion of the Wildlife Biologist associated with this project is that due to the declining habitat available to these animals, the long-term decline of these species will continue.

The statement says jurisdiction "in the West Glacier - Glacier National Park area", and the intent was not to include the community of West Glacier. To avoid confusion, the statement has been revised to read "U.S. Park Rangers have jurisdiction in Glacier National Park."

This statement has been revised.

This statement has been added to the text under "Wildernesses".

No response required.

COMMENT

Mr. Volmer K. Jensen

2

ENVIRONMENTAL STATEMENT COMMENTS

Fish and Wildlife Resources

The Fish and Wildlife Service's (FWS) biological opinion, dated August 25, 1981, included the recommendation of the West Glacier Area Study Team as an appendix to the opinion. Appendix B of the DEIS contains the biological opinion but has omitted its appendix. The final EIS should contain the FWS's biological opinion in its entirety, including its appendix.

Land, Water and Power Resources

The turnoff from Highway 2 to the Hungry Horse Dam public access road experiences heavy use during the summer months. We would have no objection to a highway configuration that provides a turning lane to accommodate this use, as appears to be indicated in Figure 28.

Recreational Resources

Highway 2 serves as the principle approach route to Glacier National Park. This Department, principally through the National Park Service, has had excellent cooperation from the State of Montana and from local communities to enhance approaches to the park. This enhancement has a subtle effect of setting a visitor's mood towards the total park experience, affecting length of stay and choice of return. Contrary to the statement on page 88, the annual "State of the Parks" report to the Congress does list "roads and urban encroachment" as potential major external threats to parks. Road approaches such as proposed for Highway 2 must therefore be designed with a great deal of sensitivity.

It appears that a highway of even width throughout its length, such as Alternatives 1, 2 and 4, has greater potential to create a "tunnel effect" that would not contribute to the esthetic enhancement of approaches to Glacier National Park. The "tunnel effect" could be reduced by using minimum road shoulders and by varying the width of the adjacent vegetation line. The variable width vegetation line would also provide an "edge effect" for wildlife cover, while at the same time providing sunlight in appropriate icy areas.

It also appears that the identified preferred Alternative 2 for a 60-foot wide, four lane highway has greater potential for hindering wildlife movement and increasing the chance of wildlife road kills than a narrower road, according to the biological opinion in Appendix B of the document.

We note that the estimated construction costs (Table 27), estimated maintenance costs (Table 28), energy savings (Table 24) and total benefits (Tables 29 and 30) indicate substantial savings between Alternatives 2 and 3

RESPONSE

An effort was made to keep this EIS analytic rather than encyclopedic and to reduce the length of the statement to reduce excessive paperwork, as required by §1500.4 of the Regulations for implementing the procedural provisions of the National Environmental Policy Act issued by the Council on Environmental Quality. The Appendix was not referenced in the text of the Biological Opinion and appeared to be oriented more toward grizzly management than impacts from potential highway improvements and was not included because it did not seem to contribute to the Biological Opinion. However, since it has been requested by the U.S. Department of Interior, it will appear in the Final E.I.S.

No response required.

The sentence on page 88 that reads "The National Park Service does not list roadway rehabilitation as a threat to Park development." has been deleted.

These recommendations will be taken into consideration during the design of the project.

Your comments have been noted.

COMMENT

when compared to the principal objective of reducing traffic congestion during July and August, the two peak travel months. Safety aspects are equally satisfied by either of these alternatives (Table 31).

Page 88 of the DEIS (except for the contrary statement noted above) identifies a number of outside influences that together threaten the resources and environment of Glacier National Park. The final EIS should specifically point out that widening of US Highway 2 to a four-lane highway would add to the proliferation of developments and activities that have a cumulative effect on the park. A specially-designed or improved two-lane road, on the other hand, would likely not have such a great additional effect.

FISH AND WILDLIFE COORDINATION ACT COMMENTS

The DEIS at page 5 appropriately recognizes the need for a section 404 permit from the U.S. Army Corps of Engineers. The U.S. Fish and Wildlife Service in its review of the DEIS determined that the proposed highway crossing of Abbott Creek would not have significant adverse effects on fish and wildlife. Thus, we would likely have no objection to the issuance of a section 404 permit for the project.

SUMMARY COMMENTS

Alternative 1 would not meet section 4(f) criteria. Alternative 5 would not meet the purposes of the project, including increased wildlife protection and traffic safety. The other alternatives would meet these concerns to varying degrees.

There are relatively minor differences between Alternatives 2 and 3, with less environmental disruption and less cost for Alternative 3 (Table 31). Given these consequences and in light of the above comments on sensitively designing approaches and reducing cumulative impacts to Glacier National Park, we recommend that the final EIS give greater consideration to Alternative 3 as a reasonably preferable option to the presently identified preferred Alternative 2.

Sincerely,

Robert F. Stewart

Robert F. Stewart
Regional Environmental Officer

cc:
Mr. Stephen C. Kozoli, Chief,
Preconstruction Bureau
Montana Department of Highways
2701 Prospect
Helena, Montana 59620

RESPONSE

The DEIS in Part IV - D - 1, "Socio-Economics", details the differences between highway alternatives that were identified through socio-economic studies. These studies indicate that although some additional development is expected to occur if the four-lane alternatives are constructed as compared to the two-lane alternatives, the overall socio-economic climate of the area is not expected to change significantly from current conditions. This was stated in the Summary of Socio-Economic Evaluation on pages 117 and 118. Based on these studies and conclusions, it would be inaccurate to state that developments and other activities that would have a cumulative impact on the Park would proliferate if a four-lane highway is built, whereas this would not be the case with a two-lane highway.

Your comments have been noted.

Due to the intense interest in this project, careful consideration of the potential impacts for each alternative was given prior to selecting a preferred alternative. The U.S. Department of Interior's recommendation that Alternative 3 be given greater consideration is hereby acknowledged.

COMMENT

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UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
FEDERAL BUILDING MISSOULA, MONTANA 59801

7700

NOV [illegible] 1981

Stephen C. Kologi
Chief, Preconstruction Bureau
Montana Department of Highways
2701 Prospect
Helena, MT 59620

Dear Mr. Kologi:

We have reviewed the Draft Environmental Impact Statement for the Hungry Horse-West Glacier project (F1-2(3)) 142 and appreciate the opportunity to comment.

A commendable job has been done in presenting the alternatives and proposed action, identifying the affected environment, and describing the environmental consequences.

1. Unfortunately, from this information on accidents, the project does not extend far enough. Improvements on the west end of the South Fork bridge are apparently needed. Hopefully, the increased delineation that has been done and which is proposed will improved the situation.

2. Since this is the same route proposed earlier and changes are minor, the impacts on National Forests are not greater. We believe most of the impacts can be satisfactorily resolved or mitigated by careful coordination in design and construction.

3. The types of traffic on this route are varied. The facility required to safely handle that mixture and volume while at the same time creating minimum impacts is obviously desired. It appears that the alternates have been carefully evaluated, and we have no suggestions for change.

Sincerely,

for TOM COSTON
Regional Forester

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RESPONSE

HUNGRY HORSE - WEST GLACIER E.I.S.

RESPONSE TO COMMENTS ON DEIS

Department of Agriculture, Forest Service
Missoula, Montana

As stated on page 152, the South Fork Bridge will be examined further by the Montana Department of Highways to see if it is an appropriate location for an additional safety project. If it is, a project may be developed that will improve the safety characteristics of the bridge.

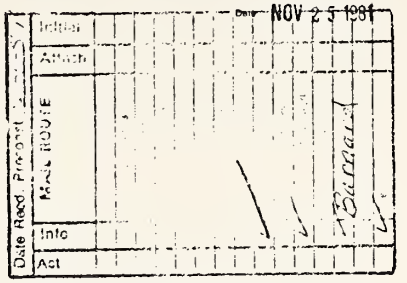
Your comments have been noted.

No response required.

COMMENT

United States Department of Agriculture | Forest Service | Flathead National Forest | 1935 Third Avenue East, P. O. Box 147, Kalispell, MT 59901

Reply to: 1950
7710
Date: NOV 2 5 1981



Stephen C. Kologi, Chief
Preconstruction Bureau
Montana Department of Highways
2701 Prospect
Helena, MT 59620

Dear Mr. Kologi:

As we interpret our responsibility, under our Memorandum of Understanding, our prerogatives do not extend to lobbying for one particular alternative or another. Therefore, except to state that at this stage in the process "do nothing" does not appear to be a viable alternative, the Flathead National Forest does not intend to state a preference. This should not be construed as a lack of interest or concern in the ultimate outcome, but rather an attempt to avoid influencing a decision not rightfully ours to make or where natural resource related impacts between alternatives is relatively insignificant. The decision to be made in selecting an alternative is far too critical to be made by counting straw votes of various agencies and publics.

We are obligated to contribute to the process of evaluating social, environmental, and economic aspects, opportunities for mitigating negative impacts and comment on the Draft Statement as we see it. Listed below are comments resulting from review of the Draft by our staff specialists.

In view of the major Wild and Scenic River concern expressed by the Forest Service at the scoping meeting for cooperating agencies on April 20, 1981, i.e., secondary effects of the proposal on the Wild and Scenic River, we do not believe the DEIS adequately addresses this concern. We include the following comments for your consideration:

Water Quality

The DEIS states that highway relocation-reconstruction can be accomplished without exceeding state water quality standards. This will require close coordination with the Montana Department of Health and Environmental Sciences and the Montana Department of Fish, Wildlife and Parks.

FS-6200-11(6-80)

195

RESPONSE

HUNGRY HORSE - WEST GLACIER E.I.S.

RESPONSE TO COMMENTS ON DEIS

Department of Agriculture, Forest Service
Kalispell, Montana

No response required.

No response required.

Such inter-agency cooperation and review is prescribed and assured by state law.

COMMENT

1. No mention was made of using de-icing salt other than on page 150. The statement was made that it should not be used except where essential for human safety. This would lead us to believe some use will be made of de-icing salt, probably in towns. Even though the use is local and presumably in small amounts, salt is very soluable and could negatively impact the area around any drainage outfall where salty water flowed. An outfall above any water supply intake is very undesirable. A salt-tolerant or salt-loving vegetative filter between salty water outfall and a watercourse could help solve the problem. Dispersal of the discharge, in effect making the pollutant a non-point source, might be the solution.

2. The DEIS states that groundwater is not likely to become polluted due to the nature of the pollutants. Again, possible contamination by sodium chloride (de-icing salts) was ignored. We agree that the pollutants listed in Table 15 (p. 95) probably will cause minimal contamination of groundwater. This may not be true for salty water. Discharge of salty water should be where it cannot readily reach groundwater. This will require consideration for the permeability and grain size of the soil and glacial or alluvial deposits above the groundwater table and how much salty water will be discharged.

3. Any outfall which will flow across the bank of a stream must be designed to prevent erosion. Eroded material might not cause streams to exceed state water quality standards but could, over a period of years, cause a visual problem.

4. The DEIS does not address the visual impacts and water quality impacts of fill along the river, i.e., the original road design included a sliver fill that reached the river on the Seiderman tract. Instances where the alternatives would result in this kind of impact should be addressed.

5. Visual impacts of drainage outfall facilities are not addressed.

6. On page 127 improved recreation access is indicated as being a benefit of the project. If increased use follows as a result of improved access as stated, an increased recreation management impact will accrue to Glacier National Park and Flathead National Forest. With current fiscal constraints such an increase would be an adverse impact on our management capability.

RESPONSE

A discussion on road de-icing salts is included in the FEIS under "Environmental Consequences - Non-Point Source Pollution".

A discussion on road de-icing salts is included in the FEIS under "Environmental Consequences - Non-Point Source Pollution".

As prescribed in the DEIS, areas denuded by the construction activity are to be re-established with suitable vegetative covers. This would include and be particularly important for erosion-prone areas. Maintenance of revegetated areas would be necessary to preserve cover, particularly on less stable slopes. Such activities are a normal part of highway maintenance activities.

The five alternatives do not involve fill sections that reach the river. The Seiderman tract remains the area of closest proximity between the river and roadway fill; however, an intrusion into the river would not occur. Significant distinctions between the "build" alternatives do not exist in this regard. Furthermore, provisions for revegetation and visual screening provide protection against any sort of adverse visual impact (see page 150).

Section I, "Visual" of Part VI - Mitigating Measures has been revised and will be included in the FEIS.

The discussion on storm drainage facilities (including visual impacts) has been expanded in the FEIS.

The increased recreational facility usage presumed due to improved access would be fairly evenly dispersed and probably slight for the near future. If substantially accelerated usage patterns become evident in the longer term, associated management needs would become a consideration at that time.

COMMENT

3

While the statement in the DEIS (p. 83) concerning archeological and historical data is basically correct, the statement is misleading. Nowhere does the statement indicate that a cultural resource inventory was conducted on the proposed project right-of-way. The Fredlund and Fredlund study (1971) did not address cultural resources along the proposed right-of-way. The survey did not include any properties downstream from Blankenship Bridge (Fredlund and Fredlund, 1971:2). A glance at the map makes it readily apparent that the proposed project right-of-way is mostly, if not entirely, out of the 1971 study area. Accordingly, the entire project area should be thoroughly inventoried for historic and prehistoric resources. This would entail an intensive pedestrian search of the right-of-way in addition to documentary and literature researches.

A statement is made that the primary visual resource of the area lies in its natural scenic character. Another statement reveals that visual impacts would not be severe. Rather than managing the entire length of the project for wildlife concerns, wildlife corridors should be identified and those areas that do not have major use by wildlife and offer views of mountain peaks or other attractions should be managed as such. The vegetation should be managed to allow views as well as break up the monotony created by the existing lodgepole wall.

The DEIS refers to the Hungry Horse Campground as "inactive" while in reality it does not exist. The original road system is still intact.

The statement is rather weak, generally speaking, on wildlife; however, the biological differences between the alternatives are minor in terms of wildlife habitat. The potential problems in terms of social or cultural change and effect on wildlife could be substantial, i.e., if the road improvement should cause a drastic change in human population.

page 28 2a 3rd sentence. Apparently Pleistocene, not Pleocene, was meant.

page 30 4) Grinnell has 2 l's.

page 31 c Faults. Credit should have been given to Johns and the information quoted rather than phrases quoted without credit and mixed with other information. Tertiary period extended from 70 to 1 million years ago.

page 93 1. Geology and Soils. It would have been better to omit (upper Piegan). Siyeh as limestone and dolomite is not synonomous with upper Piegan. Slides are not common in Siyeh where a road cut is made in to rock dipping away from the road. A cut which removes supporting rock on the dip slope may slide.

RESPONSE

The Archacological and Historical section on page 83 of the DEIS has be rewrittcn to reflcet the comments received during the DEIS review period.

Aesthetic considerations associated with the final design would dictate the exact extent of "open area" left for scenic vistas. Substantial alteration of the existing lodgepole regime is doubtful and of questionable desirability. As cited in the DEIS (see page 152), a primary focus will be to maintain the cohesiveness of the existing visual environment.

From the standpoints of right-of-way and land ownership delineation, the Hungry Horse Campground does exist, even though it is no longer used as a campground.

Changes in the study area population induced by the various roadway alternatives are projected in the DEIS (see page 113), and are not of substantial enough magnitude to create adverse impacts to wildlife resources.

The text of the FEIS will be corrected to read "Tertiary" instead of "Pleocene".

The FEIS will be footnoted to identify information quoted from sources such as Johns. The "late Cretaceous and early Tertiary" period was referenced in the text of the DEIS (see page 31), and would fall approximately 75 million years ago.

The referenee to "upper Piegan" in conjunction with the Siyeh has been deleted from the text of the FEIS.

COMMENT

page 94 1) 2) "the washoff of pollutants accumulated from the highway corridor would be less than the total generation..." Enough less to be insignificant?

1) 4) "... would be distributed..." It would not be a uniform distribution. It would be by slugs spaced over the 10.8 mile corridor.

page 98 b Groundwater. What about salt from de-icing chemicals?

page 132 b Water Resources and Quality 3rd sentence. "Suspended solids, typically clay..." should probably read clay and silt.

page 150 C Surface Water Protection. All the mitigating measures listed in Table 16 (p. 97) should be at least considered and most of them used, not just the first one.

Appendix C References.

Geology and Soils. The Johns reference is an item by itself, not part of Earthquake History.

We have a question relating to safety with the alternative utilizing 4-foot shoulders. They are wide enough to coax people out onto them when in trouble, taking pictures, etc., but not wide enough to permit clearance for following traffic. Also, is the 4-foot median of sufficient width to install traffic dividers in the future if accident statistics warrant?

RESPONSE

By analyzing the "worst case" situation in which the entire volume of pollutants generated along the highway would theoretically be discharged in a single point source, it logically follows that any temporal and/or geographic distribution of the pollutant load would lessen the pollution effect. Thus the anticipated field condition in which such distributions would indeed occur is comparatively less hazardous than the artificial situation evaluated. The latter case, as stated, harbors no significant adverse impact.

As demonstrated in the analysis presented in Part IV of the DEIS, even if all pollutants generated through the implementation of one of the highway alternatives under consideration were to completely wash off to the Flathead River, no significant adverse impact would materialize. Obviously the actual washoff of such pollutants would be substantially less than the total generation, lending an additional safeguard to the situation. Due to soil and vegetative attenuation, the use of intermediate retention facilities, etc., the resulting pollution becomes non-detectable with state-of-the-art technology.

De-icing salt as related to groundwater resources is discussed in the FEIS.

In soil/water regimes such as those indigenous to the study area corridor, clay particles constitute a predominant fraction in suspended solids measurement.

The Montana Department of Health and Environmental Sciences suggests that all guidelines, as recounted in Table 16, that are appropriate to a storm drainage project be implemented. Section C, "Surface Water Protection" of Part VI - Mitigating Measures has been revised and will appear in the FEIS.

The reference list of the FEIS will be changed to reflect this correction in format to indicate Johns as a separate reference in itself.

The use of four-foot shoulders in conjunction with certain multiple-lane alternatives does not constitute an undue safety hazard, particularly in light of the availability of additional lanes. A disabled vehicle could and should be positioned such that it is completely clear of travel lanes in the event of an emergency. In such situations, it would be possible and permissible to position the right wheels of the vehicle off the paved surface, leaving the left wheels resting on the paved shoulder. However, six-foot shoulders have been provided for the preferred alternative. A four-foot median width could accommodate certain types of traffic dividers. However, their use would not be advocated without additional study regarding the obstacle they might pose to pedestrian or wildlife movements.

COMMENT

The project is being designed for anticipated 20-year needs. Unless there is a drastic turn around in priorities for highway funding, it is more apt to be another 50 years before this section of highway is up for reconstruction again. Granted, it is impossible to look that far ahead, but the preponderance of evidence points to past practice of underestimating needs rather than vice-versa.

There is bound to be continued development and growth along the corridor. It does not appear that planned/controlled development is attainable. There are significant private holdings along the corridor. They offer the outsider a rural setting "next to the Park." Growth in Park visits will increase also. The only answer to this in attempting to limit via highway standards is to prohibit, restrict, or limit access to the facility. This might permit some reduction in standards but in turn would create demand for frontage or other duplicate roads. If concern for wildlife, etc., is to take precedence, then denial of access to private developers is an answer. This was not an included alternative.

This corridor was established as a primary access route in the late 1800's. That has been its function since.

5

Within the corridor, transportation needs should not be compromised for less than significant adverse impacts which resist mitigation.

We appreciate the opportunity to provide comment and anticipate the opportunity to provide coordination on the design phase of the project which hopefully will be in the near future.

Sincerely,

JOHN L. EMERSON
Forest Supervisor

RESPONSE

The 20-year design life employed is prescribed by state and federal standards. The serviceability of any roadway constructed, however, could approach 50 years.

Control of access can be obtained only if access rights are purchased with adequate compensation.

No response required.

COMMENT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
1860 LINCOLN STREET
DENVER, COLORADO 80295

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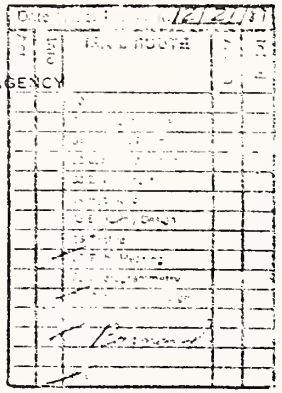

DEC 11 1981

Ref: 8MO

Mr. Stephen C. Kologi, Chief
Preconstruction Bureau
Montana Department of Highways
2701 Prospect
Helena, Montana 59620

Dear Mr. Kologi:

Thank you for the opportunity to review the Hungry Horse - West Glacier Draft Environmental Impact Statement.

First, we lend support to the water quality protection measures outlined in the EIS. These include strict erosion control measures during the construction phase and storm water control at those sites described. As stated in the EIS, the middle and main Flathead Rivers are quality water that must be protected from excessive erosion and storm water runoff.

It is stated in the EIS (p. 90) that storm water runoff will be produced which will flow into the Flathead River. The location and types of collection systems should be discussed in more detail than has been provided.

Second, we are concerned about the selection of the four-lane alternative in view of the opposition to it by both the National Park Service and the U. S. Fish and Wildlife Service. Both of these agencies are concerned about the impacts of the wide four-lane corridor on grizzly bears and the effect on bears from secondary growth generation in the West Glacier area. If an improved two-lane road will alleviate the present safety problems and handle expected traffic volumes it appears that it may be more satisfactory from a wildlife standpoint. Because of the importance of wildlife to the Glacier Park environment a safe two-lane highway should be given serious consideration.

According to EPA's rating system for draft impact statements this EIS is rated ER-2 (environmental reservations - insufficient information). We have assigned the ER rating because of the wildlife concerns. The 2 rating is assigned because we believe the EIS should discuss the storm water drainage proposals in more detail.

If you have any questions, please contact Mr. Gene Taylor in our Montana Office in Helena at (406) 449-5486.

Sincerely yours,

Steven J. Durham
Regional Administrator

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RESPONSE

HUNGRY HORSE - WEST GLACIER E.I.S.

RESPONSE TO COMMENTS ON DEIS

Environmental Protection Agency, Region VIII
Denver, Colorado

Your comments have been noted.

A more detailed discussion of the locations and types of collection systems for stormwater runoff has been provided in Part IV, Section 2a(2) of the FEIS.

The concern that the National Park Service and the U.S. Fish and Wildlife Service have about the four-lane alternative is recognized and has been considered. The wide four-lane (88-foot alternative) was not considered appropriate because of the potential impact on the natural environment with no large increase in traffic capacity and safety over the narrow four-lane (60-foot section). However, there is a significant increase in traffic capacity and driver comfort and convenience with the 60-foot four lane over the two-lane options. The cost to achieve this improvement in traffic carrying capability is small in comparison to the traffic benefits.

As stated in the DEIS, a two-lane highway (even a special design two-lane with climbing and turning lanes) will not handle the expected traffic in a satisfactory manner, even though a two-lane highway may be more desirable from a wildlife standpoint. The responsibility of the Department of Highways is to balance the natural environment factors (including wildlife impacts) with the human environment factors (including traffic capacity and the importance of the highway to the commerce of the state) to arrive at the most appropriate facility for the conditions. Because of the concern of the National Park Service and the U.S. Fish and Wildlife Service, serious consideration has been given to the two-lane special design alternative. However, this alternative does not provide a facility that will adequately handle the traffic. We have selected the minimum facility that will adequately serve the purpose for which it is intended, and have, in our minds, struck a balance between the natural and human environmental factors.

COMMENT

I-[illegible]

Memorandum

U.S Department of Transportation
Office of the Secretary of Transportation

Subject: Draft Environmental Impact Statement
U.S. 2 Reconstruction Hungry Horse-West Glacier, MT.
FHWA-MT-EIS/4(f) 81-02-D

Date: DEC 11 1981

From: Martin Convisser, Director
Office of Environment, P-20

Reply to Attn of:

To: Ali Sevin, Chief
Environmental Programs Division, HEV-10

Thank you for the opportunity to review the draft Environmental Impact Statement prepared for the proposed reconstruction of U.S. Highway 2, between the towns of Hungry Horse and West Glacier, in northwestern Montana. We offer the following comments on the project.

Wetlands. A conclusive finding should be made regarding any significant incursion on wetlands, per DOT Order 5660.1A.

Section 404 Permit(s). Early coordination with the U.S. Army Corps of Engineers and other appropriate agencies will help ensure an expeditious Section 404 permit process for this project. The final EIS should show evidence of such coordination, describe pertinent construction activities, and include commitments to necessary mitigation measures.

Local Traffic Impacts. The preferred alternative involves upgrading a segment of an existing, two-lane highway to four lanes. Traffic congestion that could result where this new four-lane section merges with the present two-lane roadway should be noted, especially if the merger would occur within or adjacent to developed areas. Pertinent mitigation measures should be discussed.

Noise. Noise levels are projected to increase significantly at the Winnaker Campground site on the proposed alignment. Possible mitigation measures should be described.

Summary of the Draft EIS. Comparative costs for each of the five alternatives should be included, as should any pertinent findings regarding wetlands intrusions. If the "Primary Impacts" Section refers to the preferred alternatives, this should be clearly stated.

We hope the above comments will be of assistance, and look forward to reviewing the final Environmental Impact Statement to be prepared for this project.

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RESPONSE

HUNGRY HORSE - WEST GLACIER E.I.S.

Response to Comments on DEIS

Department of Transportation, Office of Environment
Washington, D.C.

No response required.

A section on wetlands findings has been included in Part IV, Section C3(b) of the FEIS.

The U.S. Army Corps of Engineers has been provided a copy of the DEIS and will be sent a copy of the FEIS. Additional information has been provided on the Corps of Engineers Section 404 Permit that will be required.

The traffic analysis discusses the termination of the highway where transitions are made into two-lane highways.

A discussion of potential noise impacts and possible mitigation measures has been added to the FEIS.

Detailed costs for the alternatives are contained in the section entitled "Costs and Benefits". Since construction costs, annual costs, and maintenance costs must be balanced with anticipated benefits, it was felt that a summary tabulation of the information might prove to be misleading, and it was not included in the summary.

No response required.

COMMENT

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX C-3755
SEATTLE, WASHINGTON 98124

13 NOV 1981

NPSEN-PL-ER

Stephen C. Kologi, Chief
Preconstruction Bureau
Montana Department of Highways
2701 Prospect
Helena, Montana 59620

Dear Mr. Kologi:

We have reviewed the draft environmental impact statement for the Hungry Horse - West Glacier project, F 1-2(3)142, Flathead County, Montana, with respect to the U.S. Army Corps of Engineers' areas of responsibility for flood control, navigation, and regulatory functions. We have the following comments:

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a. Page 5, item titled "Federal." Change "U.S. Army Corps of Engineers - Section 404 Permit" to "U.S. Army Corps of Engineers - Section 404 of the Clean Water Act."

b. Page 98, first paragraph. Any stream crossings or other modifications to a flood plain should be designed to withstand a 100-year flood and to preclude aggravation of flooding.

Thank you for the opportunity to review this statement. If you have any questions regarding our comments, please contact Dr. Steven F. Dice, telephone (206) 764-3624, of my staff.

Sincerely,

for R.P. Scott, Jr., P.E.
Chief, Engineering Division

RESPONSE

HUNGRY HORSE - WEST GLACIER E.I.S.

RESPONSE TO COMMENTS ON DEIS

Army Corps of Engineers, Seattle District
Seattle, Washington

No response required.

This change has been made for the Final E.I.S.

This statement has been added to the text for the Final E.I.S.

No response required.

COMMENT

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
REGIONAL/AREA OFFICE
EXECUTIVE TOWER - 1405 CURTIS STREET
DENVER, COLORADO 80202

REGION VIII

October 29, 1981

IN REPLY REFER TO:

8SOQ-618d

Stephen C. Kologi
Preconstruction Bureau
Montana Department of Highways
2701 Prospect
Helena, Montana 59620

Dear Mr. Kologi:

Thank you for the opportunity to review and comment on the Hungry Horse - West Glacier Highway Project, F 1-2(3)142, Flathead County, Montana.

Your draft has been reviewed with specific consideration for the areas of responsibility assigned to the Department of Housing and Urban Development (HUD). The review considers the proposal's compatibility with local and Regional comprehensive planning and impacts on urbanized areas.

It would appear that the construction jobs generated by this project would have a major impact on the economies of the adjacent communities. Only two employers in the area would have more persons than this proposed construction job. Based upon this single factor Alternative 4 should be considered as viable. With this single exception we find this EIS adequate for our purposes.

If you have any questions regarding these comments please contact Mr. Carroll F. Goodwin, Area Environmental Officer at area code (303) 837-3102.

Sincerely,

Raymond D. McKinney
Director
Program Planning and Evaluation

AREA OFFICE
DENVER, COLORADO

Data Read. Preconst. 11/4/81

Act	Info	MAIL ROUTE	Attach	Initial
		20		
		20 Engr. Specialties		
		31 Contract Plans		
		32 Geo. Road Design		
		33 Environment		
		34 Hydraulic		
		35 Surveying Design		
		36 Traffic		
		37 Public Hearing		
		38 Photogrammetry		
		39 Consultant Design		
		Dimond		
		File		

RESPONSE

HUNGRY HORSE - WEST GLACIER E.I.S.

RESPONSE TO COMMENTS ON DEIS

Dept. of Housing & Urban Development
Denver, Colorado

No response required.

No response required.

Your comments have been noted.

No response required.

COMMENT

DEPARTMENT OF COMMERCE
AERONAUTICS DIVISION

TED SCHWINDEN, GOVERNOR

P.O. BOX 5178
2630 AIRPORT ROAD

STATE OF MONTANA

(406) 449-2506

HELENA, MONTANA 59604

November 17, 1981

Stephen C. Kologi, P.E., Chief
Preconstruction Bureau
State of Montana
Department of Highways
Helena, MT 59601

RE: F1-2(3)142
Hungry Horse-West Glacier

Dear Mr. Kologi:

The Montana Aeronautics Division has reviewed the above-mentioned project and in our opinion this project will not have any adverse effects on aeronautical activities in this area.

Thank you for the opportunity to comment on this project.

Sincerely,

Michael D. Ferguson, Administrator
Aeronautics Division

Vern Moody
Vern Moody
Aviation Representative

Date Rec'd.	Init.	MAIL ROUTE	Action	Initial
		30		
		31 Public Hearing		

AN EQUAL OPPORTUNITY EMPLOYER

RESPONSE

HUNGRY HORSE - WEST GLACIER E.I.S.

RESPONSE TO COMMENTS ON DEIS

Department of Commerce, Aeronautics Division
Helena, Montana

No response required.

COMMENT

Department of Justice

MONTANA HIGHWAY PATROL

1286 BURNS WAY
KALISPELL, MONTANA 59901

state gmp

US 2 highway is a main route across the northern part of the country and the State of Montana. It is used extensively by large trucks hauling petroleum products, lumber and logs, wheat and other products. The road is also used extensively by thousands of tourists in the warmer months to visit Glacier National Park. During the winter months the road is used by skiers from all over the nation on their way to Big Mountain. Also, many people snowmobile and cross country ski in this area. There are wood haulers using small pickups and trailers. Then there is the local travel of all types of vehicles including many motorcycles, also railroad crews sometimes traveling in bus caravans.

The tourists are traditionally slow moving traffic traveling with motor homes and trailers. There are the small under-powered cars that are slowed on the hills. The large trucks are slowed on some of the hills then speed and pass when they can. Other vehicles do drive at the speed limit when they can. On two-lane roadways on the hills and curves this type of traffic does get tied up in long lines. As a result on a two-lane roadway frustrated people tend to make bad passes on curves and hills, speed when they can and become reckless. A driver under the influence of alcohol even to a slight degree can be devastating in this situation.

A FOUR-LANE ROADWAY TENDS TO ALLEVIATE THE PREVIOUSLY MENTIONED SITUATION.

Lt. Tom Sanford

RESPONSE

HUNGRY HORSE - WEST GLACIER E.I.S.

RESPONSE TO COMMENTS ON DEIS

Montana Highway Patrol
Kalispell, Montana

No response required.

Your comments have been noted.

COMMENT

FLATHEAD COUNTY SAFETY COUNCIL

P.O. BOX 1011 • KALISPELL, MONTANA 59901

November 27, 1981

Mr. Stephen Kolosi, Chief
Preconstruction Bureau
C/O Mr. Dan Bertsch, Manager
Public Hearing Unit
Montana Dept. of Highways
2701 Prospect Ave.
Helena, Montana 59620

Dear Sirs:

The Flathead County Safety Council offers the following concerning the Hungry Horse-West Glacier Draft Statement. These comments are intended to supplement those entered into the record at West Glacier November 18th. Our comment at that time was necessarily briefly summarized due to the obvious volume of material to be entered into the record.

We have three basic concerns, all of which, when reduced to lowest common terms, deal with public safety.

Our first deals with an obvious lack of depth in addressing the safety subject in the Draft. One readily reads into the report an implication that human road kills are less significant than those experienced by wildlife. Particularly in light of our awareness of the mission and responsibility of the public highway agencies and in light of the fact that current technology permits mitigation of adverse consequences to redeeming that responsibility. We feel obligated to speak out in favor of liniting human loss (death, suffering, and financial loss) while mitigating secondary impacts. Admittedly, however, there are no definitive ways of comparing such values. It might be well to point out that to the best of our knowledge there has never been a highway related bear kill while loss of human life on the segment under conderation is a significant annual occurance.

Although we do not now have hard statistics which refute your projections, we seriously question anticipated accidents rates for the various alternatives listed in the comparisons Tables #23 and #31 and ask that concerted efforts be made to correct or varify them in a manner which provides evaluation of their validity. Accident rates for the full 4-Lane (38') alternative should be a matter of record provided by actual experience in several locations (for instance, LaSalle Road - Glacier Park International Airport to Highway 40 here locally. At last report there has not been a highway related accident on this facility since it was placed in service.) Also, we suggest a before and after look at the reconstructed section of U. S. #93 between Polson and Ronan for comparison

(continued)

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RESPONSE

HUNGRY HORSE - WEST GLACIER E.I.S.

RESPONSE TO COMMENTS ON DEIS

Flathead Safety Council
Kalispell, Montana

No response required.

A detailed study of the safety aspects of the project including a comparison of the traffic safety for each alternative, a summary of the information collected, analyses conducted, and conclusions of the safety investigation are contained in the DEIS. The background information is available for review upon request.

Your comments have been noted.

COMMENT

FLATHEAD COUNTY SAFETY COUNCIL

P O. BOX 1011 • KALISPELL. MONTANA 59901

relative to an up-graded standard 2-Lane. Figures for Special Design 2-Lane and Limited Width 4-Lane Alternatives may be considerably harder to obtain. It will take some hard figures, however, to convience those of us who monitor accident statistics that the Limited 4-Lane is only slightly more hazardous than a design providing full width shoulders and median or that no significant difference exists in the accident record per M. V. M. between the Limited 4-Lane and the Special Design 2-Lane. Years of experience with 3 lane highways in high traffic density situations and passing lanes on hills has adequately demonstrated the impact of the confusion and invitation for risk taking they create. In this case, we have to see varified figures to believe it.

Our second concern pertains to the extreme weather condition periodically but commonly existing in the Canyon during the winter months. In terms of perils faced by the driving public, the increased hazards presented by the summer influx of tourists is secondary to those imposed by adverse winter weather. Ice, wind, and blizzard conditions provide challenges not addressed by the Draft. Much of the inter-state traffic as well as local travel goes on without significant reduction year-round. In fairness, this topic should be analyzed in detail.

Closely related to this concern is the fact that projections deal with a socalled 20 year design life when in actual practice it is more apt to be another 50 or more years before opportunity to meaningfully treat this segment of highway occurs again. This makes it 2.5 times more critical that the right decision be made now.

The third concern relates to what appears to constitute a rather thinly veiled drive to impose de-facto zoning within the Canyon via control of highway construction standards. We do not consider this to be an appropriate public highways function - particularly at the expense of the well-being of the traveling public. There is no presumption to speak for anyone other than ourselves in this respect in spite of the fact that it appears to be a consensus opinion. If development control within the corridor is truly an objective, then it warrents open treatment through formal zoning and/or denial of direct highway access in a manner permitting adequately dealing with intra and inter-state traffic service demands. This corridor was dedicated to transportation purposes a century ago and has been in continuous use for that purpose since. Developments

(continued)

RESPONSE

Actual accident figures for highways in Montana that are similar to the alternatives considered were used to estimate the accident potential for each alternative. These included the two locations suggested by the Flathead County Safety Council (LaSalle Road and U.S. 93 between Polson and Ronan). In the interpretation of these figures, however, the similarity of conditions must be acknowledged as well as the accident rates. For instance, the accident rate for LaSalle Road is low but it is in flat terrain, whereas the same section on the Hungry Horse - West Glacier corridor would have more curves and grades. The physical features of the highway affect the accident rate in addition to the traffic volumes and the highway section. These factors were considered in selecting the accident rate for each alternative.

Your comments have been noted.

Your comments have been noted.

COMMENT

RESPONSE

FLATHEAD COUNTY SAFETY COUNCIL

P.O. BOX 1011 • KALISPELL, MONTANA 59901

Page 3 continued

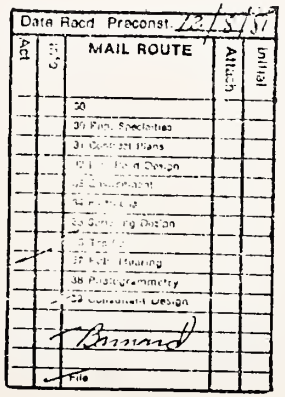
along the route, nearly without exception, are in existence by virtue of the highway's presence rather than vise versa. This fact should not be discounted in the decision making process.

We thank you for the opportunity to respond to the Draft Statement. The Council is very much committed to participating in the environmental assessment/impact mitigation process; particularly when all factors are identified and placed and kept in perspective. On the other hand, we are just as strongly committed to resisting tendencies to impose unnecessary restraints or expense on a proposed undertaking or alternative selection. As difficult as it may be to accomplish, success or failure depends on how completely, rationally and dispassionately the process is followed.

Sincerely,

James T. Dedman,
Secretary, Treas.

John E. Franklin,
President



We agree that highway design should not be used to avoid legally prescribed zoning procedures. However, the law requires that secondary effects of highway design, including the potential for increased development, be examined in the EIS.

No response required.

COMMENT

Flathead Drainage 208 Project

723 5TH AVE. EAST — ROOM 402

KALISPELL, MONTANA 59901

PHONE 755-5300 EXT. 228

November 30, 1981

Stephen C. Kologi, Chief
Preconstruction Bureau
Montana Department of Highways
2701 Prospect
Helena, Montana 59620

Dear Mr. Kologi:

By this letter we respectfully transmit our comments on the Hungry Horse-West Glacier Draft Environmental Impact Statement. No position with regard to alternative selection is taken; however, there are a number of points regarding the evaluation of the environmental assessment that need to be addressed before any alternative is selected.

Surface Water

1) Flows are over estimated for the Middle Fork of the Flathead River. Instead of 3,000 cfs listed in the EIS, should use 400-500 cfs typical of March flows when the low elevation melt starts and the corridor runoff is likely to occur. Further, these low flows are typical of conditions when chinooks occur.

2) Abbott Creek flow and chemical/biological data are available. Recent flow and chemical data are enclosed (Table 1). Flows at the corridor in Abbott Creek are estimated to be 4 cfs when the low elevation melt in the corridor would normally occur. Storm runoff could significantly affect Brook Trout fry emergence. Storm flow discharges should be carefully examined if they are to occur in Abbott Creek.

RESPONSE

HUNGRY HORSE - WEST GLACIER E.I.S.

RESPONSE TO COMMENTS ON DEIS

Flathead Drainage 208 Project
Kalispell, Montana

No response required.

The potential pollutant comparison presented appropriately employed the average annual flow rate for the Middle Fork of the Flathead River because individual pollutant contributions were projected on an annual basis. It would not be realistic to compare annual pollutant loads with a temporary low-flow condition. The comparable flow contribution of the North Fork would afford sizeable additional dilution capability, yet was purposely ignored to lend conservativeness to the comparison. Furthermore, the many-fold factors of safety reflected in Table 15 between the potential runoff contributions for various pollutants and the ambient river concentrations and MDHES-permitted concentrations would remain extremely conservative even if the lower flow rate (i.e., March flow) for strictly the Middle Fork was used for the comparison.

The water quality data provided for Abbot Creek is appreciated. This data, along with additional information provided by Ron Barger of the U.S. Forest Service and Dr. Nellie Stark of the University of Montana School of Forestry, has been evaluated, and empirically substantiates the conclusions of the DEIS in regard to the water quality of the stream. The paragraph describing the water quality of Abbot Creek in Part III of the FEIS has been revised.

Due to the very limited dilution potential, point source discharges of stormwater runoff are not contemplated for Abbot Creek. Compliance with MDHES Stormwater Runoff Guidelines and mandated design reviews by MDHES and the Department of Fish, Wildlife and Parks would assure that, as recommended in the DEIS (page 98), due consideration was given to fisheries preservation at the highway crossing of the stream. The adequacy of design provisions for the control of non-point discharges would be evaluated in such reviews.

COMMENT

3) The model used to predict pollutant generation is invalid for this project.
   (a) Page 3 of Report No. FHWA/RD-81/044,"...data used to develop the predictive procedure are only for non-winter months."
   (b) Page 52,"...the procedure is not meant to evaluate

S. Kologi, 11/30/81, page 2.

winter snowmelts and frozen ground conditions, only nonwinter periods should be evaluated." Emphasis added.
   (c) According to data in the EIS, 35% and 45% of the precipitation at Hungry Horse and West Glacier, respectively, is snow.
   (d) Average annual flows used in EIS are not representative of flows in rivers and streams when snowmelt would occur in the corridor. Low elevation melts occur in March. Middle Fork flows would be on the order of 453 CFS, not 3,000 cfs as listed in the EIS. Hence, dilution would be half of the expected value in the EIS.

The model chosen involves the use of two separate site condition types - Site II and Site III. In either case, the length of the project is an input but not road width. Hence, varying road widths are not evaluated by the model.

Assumption three (3) is invalid during chinook conditions and potential frozen ground. Vegetation and soil adsorption will be ineffective in winter conditions.

Assumption four (4) is arguable given that a storm drainage system will be developed and result in one or more point discharges. Local impacts at point of discharge could be severe.

Designation under the Wild and Scenic River Act creates a management emphasis to maintain "unpolluted waters". Hence, designation does affect local management decisions.

RESPONSE

The portion of the model used to predict pollutant generation for this project (Ref. Report No. FHWA-RD-81-042-046) was validly applied. The model includes procedures for determining annual pollutant generation based on type of roadway site and traffic load. This was the portion of the model applied to this project, and it remains valid irrespective of climatic conditions. Additionally, the model would allow, through an iterative procedure, the projection of annual pollutant wash off on a per-storm basis for an indefinite number of storms, based on local climatic input parameters. This particular procedure would not account for extended freezing periods and was not employed.

The modeling technique empirically substantiates that traffic volume, not roadway width, is the deciding factor in pollutant generation and accumulation.

Obviously, frost and/or snow cover would interfere with runoff pollutant attenuation in soil and vegetation. Within that context, "assumption (3)" was presented as a non-winter phenomenon. Furthermore, the four "assumptions" presented are not assumptions in themselves; rather, they are presented as justifications for the conservativeness of the general assumptions made for application of the FHWA model (specifically, "It was assumed that all pollutants (solids) generated by an ADT of 5,000 vehicles per day along a 10.8-mile route would be discharged directly to the Middle Fork of the Flathead River.")

The essence of justification (4) is that the assumptions made are very conservative since, for purposes of comparison, the entire pollutant load generated along the 10.8 miles of highway was projected to be diluted by only the average flow of the Middle Fork of the Flathead River, rather than the combined flows of the Middle Fork and the North Fork. Thus the dilution afforded has been theoretically reduced by approximately half of what realistically would occur in the field.

The Wild and Scenic River designation affects management decisions but does not impose a specific set of water quality parameters.

COMMENT

Groundwater

1) Determining potential impacts requires resource delineation yet the EIS does not:
   (a) map the aquifers in the corridor,
   (b) identify recharge areas,
   (c) identify the aquifers used for domestic water supplies,
   (d) identify locations of existing wells,
   (e) identify proposed locations of storm water settling basins.

2) "Major" aquifer(s) should be defined in the EIS. Todd (1980) defines an aquifer as "...a formation that contains sufficient saturated, permeable material to yield significant quantities of water to wells and springs". This definition is met in the corridor. Proper location of settling basins will necessitate identification and mapping of potentially impacted aquifers.

3) Are the aquifers in question confined or unconfined? If they are unconfined, they are very susceptible to contamination.

4) Plotting chemical data for community wells and the Middle Fork of the Flathead indicates the waters are distinctly different but representative of normal uncontaminated conditions (Table 2). If the wells are as shallow as 22-150 ft. and unconfined, they

S. Kologi, 11/30/81, page 3.

are extremely susceptible to contamination.

5) Frequently the Siyeh Formation constitutes a developed aquifer in the drainage. It is a heavily fractured limestone. The road cut will cross the formation in one or more places. Storm water exceeds sewage effluents in total suspended solids, the carrier for most toxic substances in storm water, and should not be permitted to infiltrate directly into the formation.

RESPONSE

Upon consultation with the MDNRC, USGS, MDHES and other local, state and federal agencies, it is evident that no formal delineation of aquifers or recharge zones exists for the study area. A thorough evaluation of available well logs, well water quality analyses and special groundwater studies was made, and served as a basis for characterizing groundwater resources of the area. The use of groundwater for municipal and/or domestic supplies was investigated. Wells logged in the area were also plotted along the corridor, although this information was not deemed significant for inclusion in the DEIS as a figure. Based on the investigations performed, significant adverse impacts will not result from the proposed action, and additional specialized study solely for the purpose of aquifer mapping is unwarranted. The exact locations of stormwater settling basins is a design consideration contingent upon the constraints of the FEIS and reviews by the regulating agencies involved.

Aquifer mapping is not necessary to safely locate stormwater settling basins; alternate data is available to accurately assess groundwater conditions as described above. Groundwater conditions, soil structure and permeability, and proximity to domestic supplies become obvious considerations in the siting and design of stormwater retention facilities, and are closely scrutinized in regulatory agency reviews during the design process.

Categorical classification of groundwater resources in the study area are not available, but empirical data indicates that currently exploited groundwater is largely of flood plain alluvium origins. The glacial outwash nature of much of the material would imply that such groundwater is unconfined, but spotty in occurrence and interbedded with silt and clay lenses.

Contamination can be a comparatively greater hazard to unconfined aquifers, but pollution of roadway origin is not currently evident in existing wells. As documented in the DEIS, pollutant volumes are most directly related to traffic volumes, and the slight increases projected in ADT by virtue of the proposed project will not significantly alter the status quo in this regard.

As noted in Figure 4 of the DEIS, the Siyeh Formation would be crossed by the proposed highway construction at the Abbot Creek crossing. The predominance of clay and silt (materials of restrictive permeability) in the native overburden that would logically be used for roadway subgrade and borrow ditch topsoiling, coupled with the narrow corridor of the crossing, would minimize infiltration into the formation. Furthermore, suspended solids and their associated pollutant load are effectively filtered out in the upper few feet of soil during the percolative process. Vegetative cover assists in this process. Cations such as heavy metals, although they would accrue in comparatively infinitesimal quantities from roadway origins, are effectively attenuated in the soil matrix by clay particles.

COMMENT

In summary, the contamination potential has not been carefully evaluated and the information presented is erroneous. The model is inappropriate for this situation as are the flows of the receiving streams. Potential impacts on the groundwater resource cannot be evaluated based on the information presented, certainly not to the point allowing a decision that "no adverse impacts to groundwater as a result of percolation of contaminated water are anticipated with any alternative under consideration."

Thank you for the opportunity to comment on this EIS. If you have any questions, please contact me at your convenience.

Cordially,

Marc M. Spratt

Marc M. Spratt
Director

cc: Sharlon Willows, Canyon Coaliation
Bob Schumacher, MT Fish, Wildlife and Parks

Enclosures

MMS:dc

RESPONSE

The potential for surface and groundwater contamination has been carefully and objectively evaluated in the course of the preparation of the DEIS. The information presented is valid and based on the most current data available at this time. Likewise, the modeling techniques employed are correct in the context in which they were used. They have been subject to extensive empirical verification, and represent the most current state-of-the-art methodologies available. Groundwater resources of the study area have been given thorough consideration, and based on the best available information, the conclusion of "no adverse impacts . . ." is an accurate one.

Literature Cited

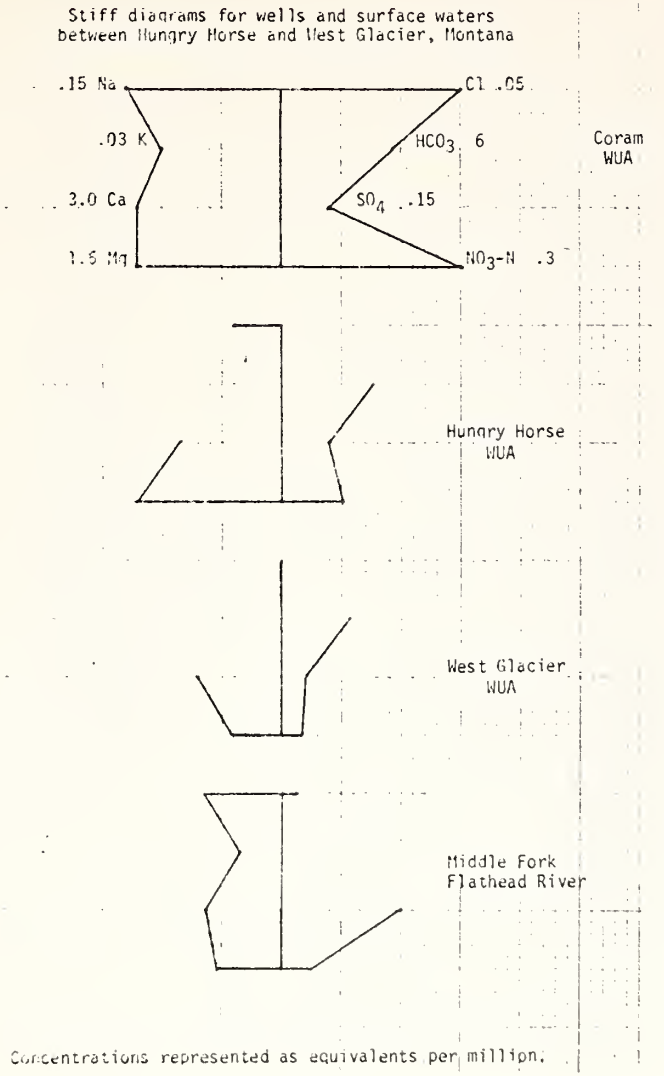
Federal Highway Administration, 1981, Constituents of Highway Runoff-Vol. III. Predictive Procedures for Determining Pollutant Characteristics in Highway Runoff, Report No. FHWA/RD-81/044, 197 p.

Federal Highway Administration, 1981, Project F 1-2(3) 142 Hungry Horse-West Glacier Draft Environmental Impact/4(f) Statement, FHWA-MT-EIS-81-02-D, 153 p.

Todd, D.K., 1980, Groundwater Hydrology, 2 ed.,John Wiley and Sons, 535 p.

United States Geological Survey, 1981, Water Resources Data for Montana-Vol. 2 Upper Columbia River Basin, Water Data Report MT-80-2, 184 p.

Stiff diagrams for wells and surface waters between Hungry Horse and West Glacier, Montana



Concentrations represented as equivalents per million.

Table 2.
Chemistry for wells and surface waters between Hungry Horse and West Glacier, Montana

	Na	K	Ca	Mg	Cl	SO_4	NO_3-N	CO_3	HCO_3	
6/23/78										
Coram	3	1	49	15	2	3	.9	0	229	WQB
Hungry Horse	1	-	35	15	1 (e)	3	.3	0	187	.
West Glacier	-	-	29	10	-	1	.1	2	142	
9/13/78										
Mid Fork	1.5	.3	25	6.4		5.1	.1			UMYB
6/19/80										
Main Stream	1.0	.3	20	5.2	.2	2.9	.15	-	86.56(e)	USGS

e = estimated values
WQB = Water Quality Bureau publication, Model State Information System.
UMYB = University of Montana, Yellow Bay Biological Station; publication, Annual Report of Work Completed During 1978-79 on Limnology of Flathead Lake-River Ecosystem, Montana.
USGS = U.S. Geological Service; publication, Water Resources Data for Montana Vol 2. Upper Columbia River Basin.

Table 1. Abbott Creek flow and chemical data

Name	Analysis Run	Na mg/l	K mg/l	Ca mg/l	Mg mg/l	HCO_3 mg/l	Cl mg/l	NO_3 mg/l	SO_4 mg/l	PO_4 mg/l	TSS mg/l	Q cfs
6/4/81 Below 23	YB	1.2	0.5	40.6	18.9	166.		.48	2.35	.001		
Abbott Ck below	YB	1.4	0.7	33.1	17.4	138.		.16	3.2	.0012		
Abbott Ck flume	YB	1.5	0.5	37.3	22.45	175.		.29	3.2	.0012		
7/2/80 Abbott Ck Below flume (culvert)	YB	1.4	0.5	52.6	21.0	199.		.60	2.45	.0009		
Drainage (23)	YB	1.5	0.6	40.2	20.2	171		.19	3.3	.0003		
flume-Abbott Ck	YB	1.4	0.5	37.6	20.2	168		.28	2.75	.0003		
10/21/80 Abbott Ck flume	YB	1.5	.45	29.2	15.1	184	.12	.30	2.6			
Abbott Ck below	YB	1.6	.51	33.0	17.4	202	.15	.22	2.9			
Below 23	YB	1.5	.56	53.2	22.8	252	.31	.73	2.5			
3/26/81 Abbott Ck flume	YB	1.4	.41	37.9	21.8	220	.22	* .06	* .94			
Below 23	YB	1.3	.47	51.4	23.2	269	.20	* .16	* .78			
Abbott Ck	YB	1.6	.58	39.2	20.2	222	.27	* .02	*1.1			2.8-3.1e
4/29/81 Below 23	YB	1.2	.58	41.5	17.9	207	.26	.14	* .79	*	**	1.75e
Abbott below flume	YB	1.2	.63	31.6	13.6	161	.21	.01	* .94	< .001	1.8	6.87
Flume	YB	1.4	.45	36.3	21.1	202	.24	.06	* .92	< .001	BDL	2.01
5/23/81 - Abbott Ck	YB	1.4	.61	38.4	16.6	192	.22	.02	*1.0	< .001	.5	
Flume	YB	1.4	.43	38.6	19.4	195.6	.40	.06	* .95	< .0011	BDL	
Below 23	YB	1.3	.53	48.4	18.4	239.0	.39	.15	* .84	< .0010	not taken	4.67
6/18/81 -Abbott Ck below		1.4	.7	35.4	17.4	197	.26	.027	3.6	.002	EC=272	7.2
at flume	UM	1.4	.7	35.2	17.5	196	.21	.034	3.5	.002	EC=300	3.38
		* Not enough water										
		** Not taken										
		YB = Yellow Bay Biological Station; UM = Dept. of Chem. U of M										
		BDL = Below detection limit.										
4/19/81-H flume	UM	1.5	.4	34.9	21.6	217	.18	.066	3.1	.001		2.008

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